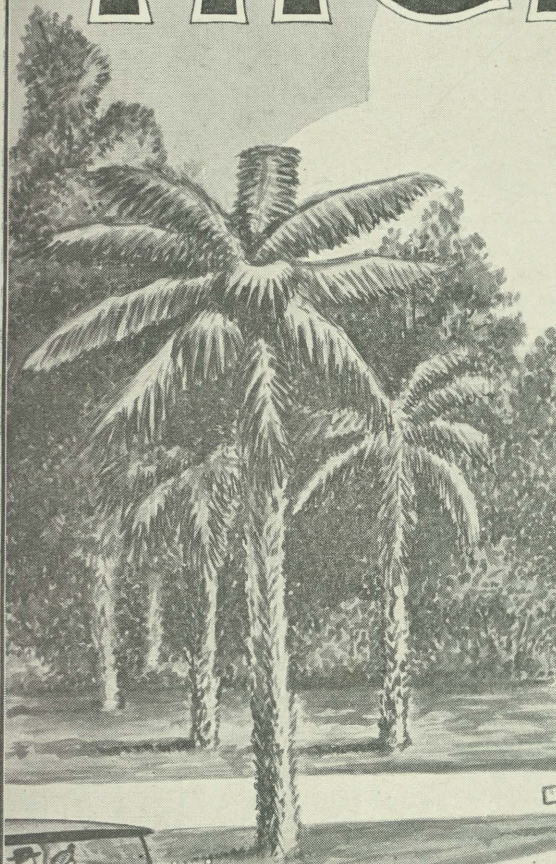
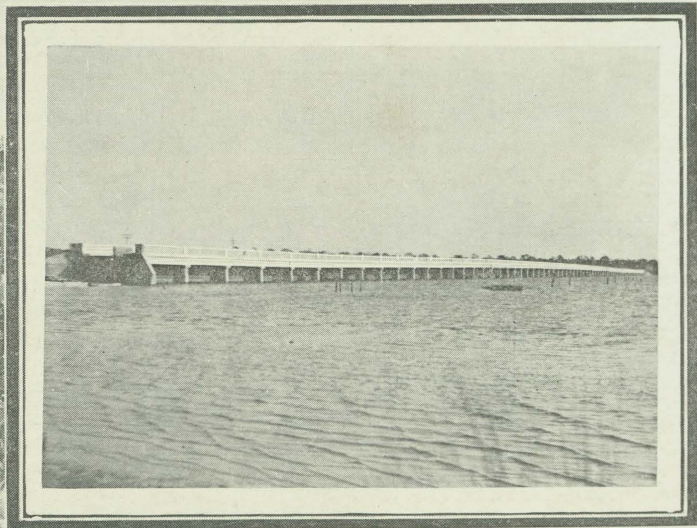


# FLORIDA HIGHWAYS



Vol. 1

*Published by the State Road Department*

No. 4

MARCH  
1924

WRIGHT  
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# KOEHRING

## What's the Overhead of Wear and Tear?

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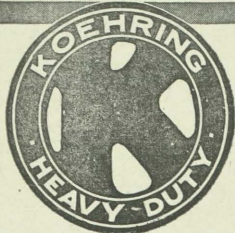
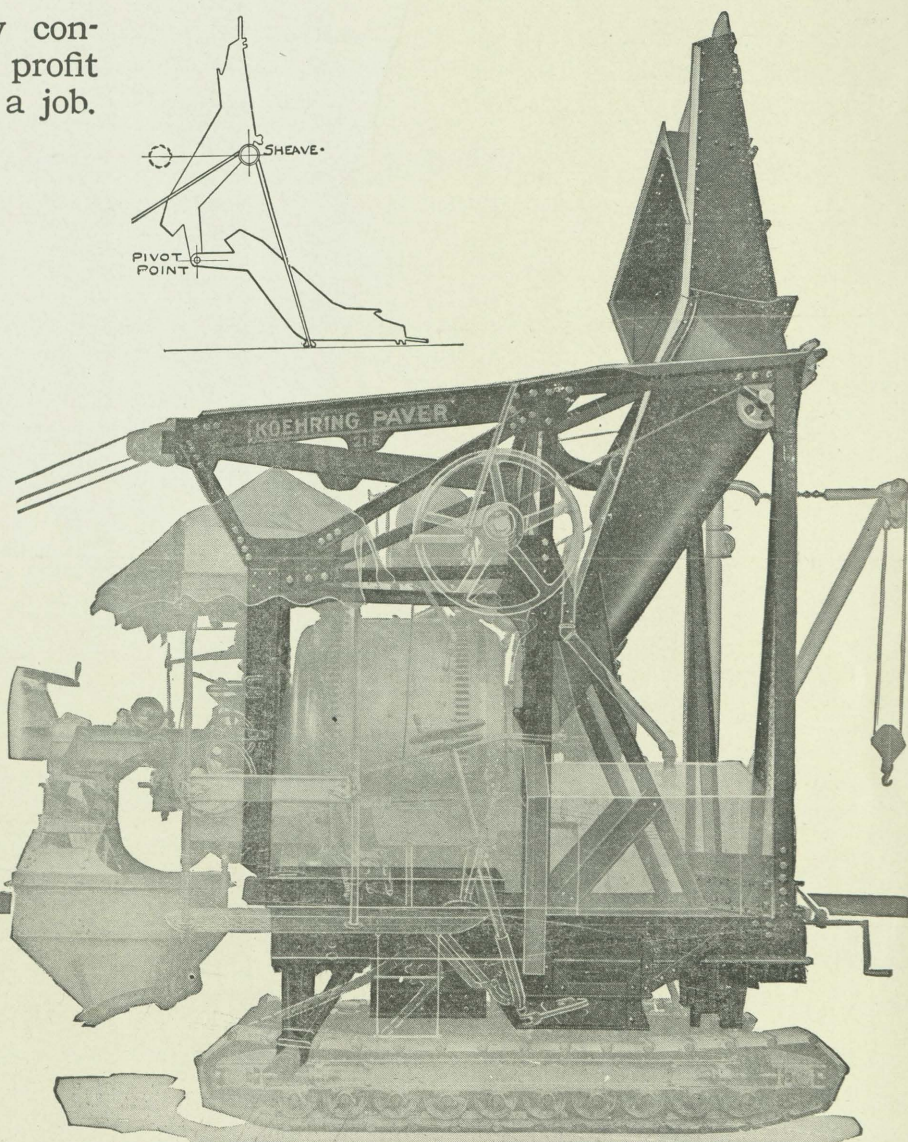
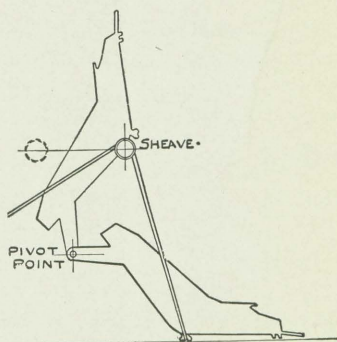
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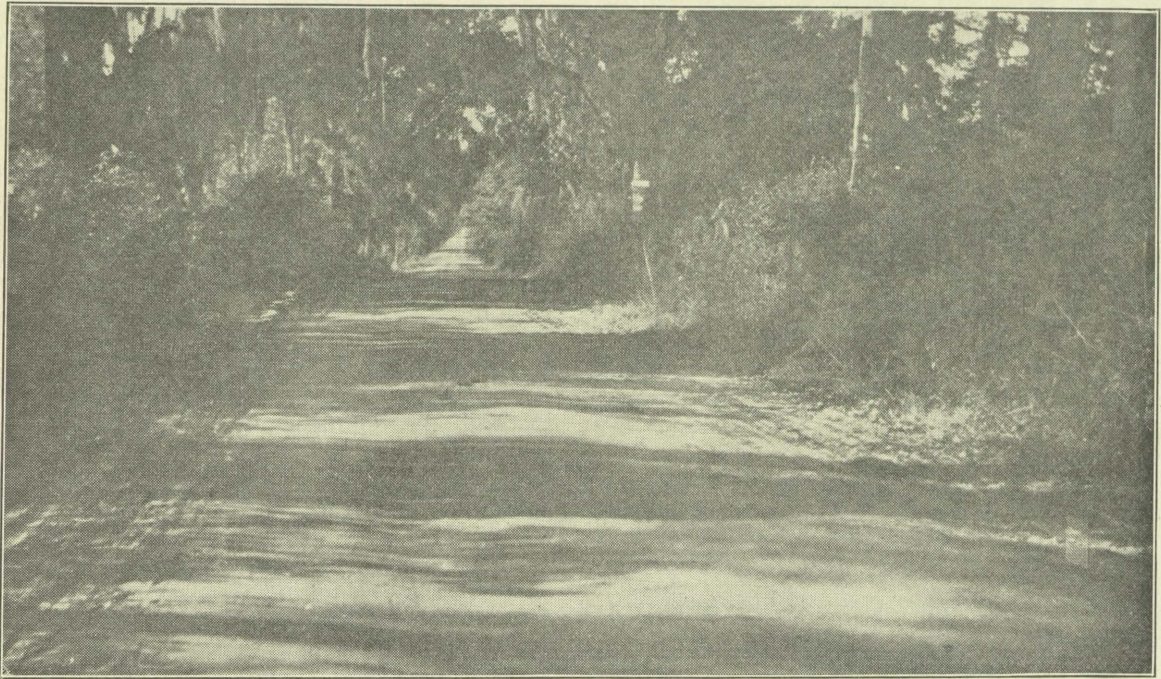


# FLORIDA HIGHWAYS

Vol. 1

MARCH, 1924

No. 4



## Let's Beautify Our Good Roads

By KARL LEHMANN, Chairman Orange County Beautification Commission and Chairman Beautification Committee, Florida Development Board.

Florida was convinced long ago of the value of good roads but we are just awakening to a realization of the possibility of beautifying our highways. This is naturally our next step.

This great state of ours has many wonderful assets, our citrus fruits are the juiciest and finest raised in the world, our vegetable and berry products cannot be surpassed, our phosphate, lumber and fish mean much to us, but greater than these are three tremendous assets which we sometimes forget: Our boys and girls growing into strong man and womanhood, our matchless climate and the natural beauty of this great state in which we live.

It has been said that if we couldn't raise an orange, a tangerine nor a grapefruit, if we couldn't produce potatoes, tomatoes, cabbage, beans, cucumbers and strawberries, if our soil would produce nothing, our land would still be worth \$1,000 an acre just for the wonderful climate that exists above it.

This splendid climate and the natural beauty of Florida draw to Florida tens of thousands of visitors every year, coming from every section of America and the world. Such men as Henry Ford, Thomas A. Edison, Roger Babson, William Jennings Bryan,

John D. Rockefeller, whose wealth and position permit them to spend their winters and summers where they will, elect to come to Florida because of its climate and natural beauty.

The tourist crop is one of our best and most profitable and yet we do less to cultivate this crop than we do any other.

### Highway Beautification

Nothing will give our tourist friends greater pleasure than our perfect climate and the beautifying of our great highways. While we are making it more attractive for our northern friends we are adding to our own pleasure and delight.

There are at least five things to be done in an adequate program of highway beautification.

First, we must see to it that our great natural beauty is preserved. There is too much thoughtless cutting down of magnificent old trees along our highways. Most any fool can chop down in a few minutes a great tree that it has taken God decades and centuries to make. The man who needlessly cuts down a

(Continued on Page Four)





# Florida Highways

Published Monthly  
Official Publication of the State Road Department

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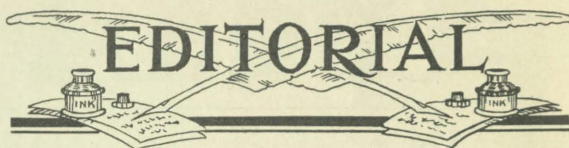
Application has been made for transmission through the mails as second-class matter.

B. A. Meginniss, Attorney for the Department,  
Editor and Business Manager

Volume 1

March, 1924

Number 4



## THE PROPOSED BUDGET OF WORK

Elsewhere in this issue we are reproducing the proposed budget of work for the year 1924, which the Department adopted, under the provisions of the Act of 1923, at its first quarterly meeting held in January. We are also publishing the estimate of resources which was also prepared by the Department under the provisions of the statute in question.

This budget has appeared, agreeably to law, in newspapers published in the designated cities, and our purpose in carrying it into our magazine is that it may receive the widest possible publicity. As stated in the notice, a public hearing on this budget will be held at Orlando on March 14th, at which time the Department will hear all complaints and suggestions by the public as to any changes in the said budget of work.

The budget as prepared represents very careful and painstaking work on the part of the members of the Department and the engineering force. There have been carried into it every piece of work under contract, the work authorized but not under construction and a number of new projects. When comparison is made between the resources available and the work proposed to be done, it will be readily apparent that the budget of work does, as required by the law, contemplate exhausting "the resources available for road construction and maintenance" for the year 1924.

After hearing the complaints and suggestions offered at the Orlando meeting it will be the duty of the Department to adopt its final budget for the year, and it is not anticipated that any material changes will be urged, the work as outlined contemplating, in the judgment of the members of the Department, the most urgent and important projects of maintenance and construction to be undertaken.

## WITH THE EXCHANGES

We have received with considerable pleasure Volume 1, No. 1, of "California Highways." This magazine, which is an interesting and valuable addition to the State Highway publications, contains many excellent articles and illustrations, attractively arranged and presented. If one may judge by the first number, the publication will take a prominent place among the magazines and bulletins issued by State Highway authorities.

Michigan Roads and Pavements has recently blossomed out with a new cover design which adds greatly to the physical attraction of the magazine. One is inclined to suspect that Mr. Hannen, the editor, finding it impossible to improve the general make-up and contents of his publication, decided upon the cover as the only feature offering opportunity for improvement.



### SEMINOLE BRIDGE

The insert on this month's cover design is a photograph of Seminole Bridge, known as Project No. 526, on Road 15 in Pinellas County.

This bridge, which is of concrete deck girder construction, is 2,008 feet in length (2,500 feet, including the fills) and spans Long Bayou in Pinellas County. It maintains the standard of the Department for bridges of beauty and permanence.

### WE EXTEND SYMPATHY

Just as we were preparing to go to press, news was received in Tallahassee of the death, on February 9th, at St. Luke's hospital, of Mr. Henry Philips, son of Judge H. B. Philips, Chairman of the Department. Mr. Philips' death followed an operation and a short illness, and the news of his death came as a shock.

Judge Philips was summoned to his son's bedside on Friday, the 8th, and remained until after the funeral, which was held at South Jacksonville on Sunday. The sincere sympathy of the members and employes of the Department is extended to Judge Philips in his bereavement.

These sad circumstances explain why we are not carrying an editorial in the Chairman's Column this month.

### GOOD HIGHWAYS REALLY COST THE STATES NOTHING

From 1917, when the war tax was placed upon automobiles, motorcycles and motor trucks and accessories, the Government collected from these interests up to June 30, 1923, a total of \$589,012,021.

During the same period, in its Federal Aid highway and forest road construction, together with all administrative outlays connected therewith, the Government expended \$264,782,216, or considerably less than one-half of what it collected from these interests.

The automobile revenues of the Government for the fiscal year ended June 30 last amounted to \$146,000,000, and the amount expended by the Treasury for Federal Aid highway purposes was \$72,000,000.

Thus the owners and operators of motor vehicles are, as recently shown by Secretary Wallace of the Department of Agriculture, paying into the Government more than double the entire Federal expenditure for roads.

A recent report by Chairman Page of the North Carolina Highway Commission gives specific proof of the value of good roads in lessening the consumption of gasoline. In that State 142,284 automobiles in 1920 used an average of 520 gallons of gasoline. But in 1922 there were 181,955 cars operating on an average of 463 gallons per car, showing a material reduction in the amount of gasoline consumed, due to good roads.

The States and the Federal Government, the one through taxation on gasoline and on cars and accessories, and the other through the war tax on motor vehicles of all kinds, are receiving an enormous revenue which would not have been deemed possible a few years ago. Automobile users are thus paying to the States and the Federal Government more than is being expended upon the building of highways; more-

over these highways are contributing enormously to the progress of the entire country and developing an amount of transportation of passengers and of freight which but for the automobile industry would have so completely swamped the railroads as to have caused a complete breakdown of the whole railroad system of the country.

While every interest, and every man, woman and child are benefited by the building of highways, those who are not using automobiles are getting these benefits without contributing one dollar toward the highways, for the States and Federal Government are receiving more from this industry than they are paying out.

When bonds are issued for the building of highways the interest is taken care of by the automobile industry, and the bonds will be retired out of the tax on that industry, including the tax on gasoline. Thus any and all indebtedness incurred for the building of highways, while adding immensely to the progress and prosperity of every community in which a good road is built, really cost the States nothing. These highways are in reality being constructed without a dollar of cost to the country except as the automobile users pay the entire bill; and the automobile users are perfectly willing to do this for the sake of having the use of the roads made possible through their work.—Manufacturers' Record.

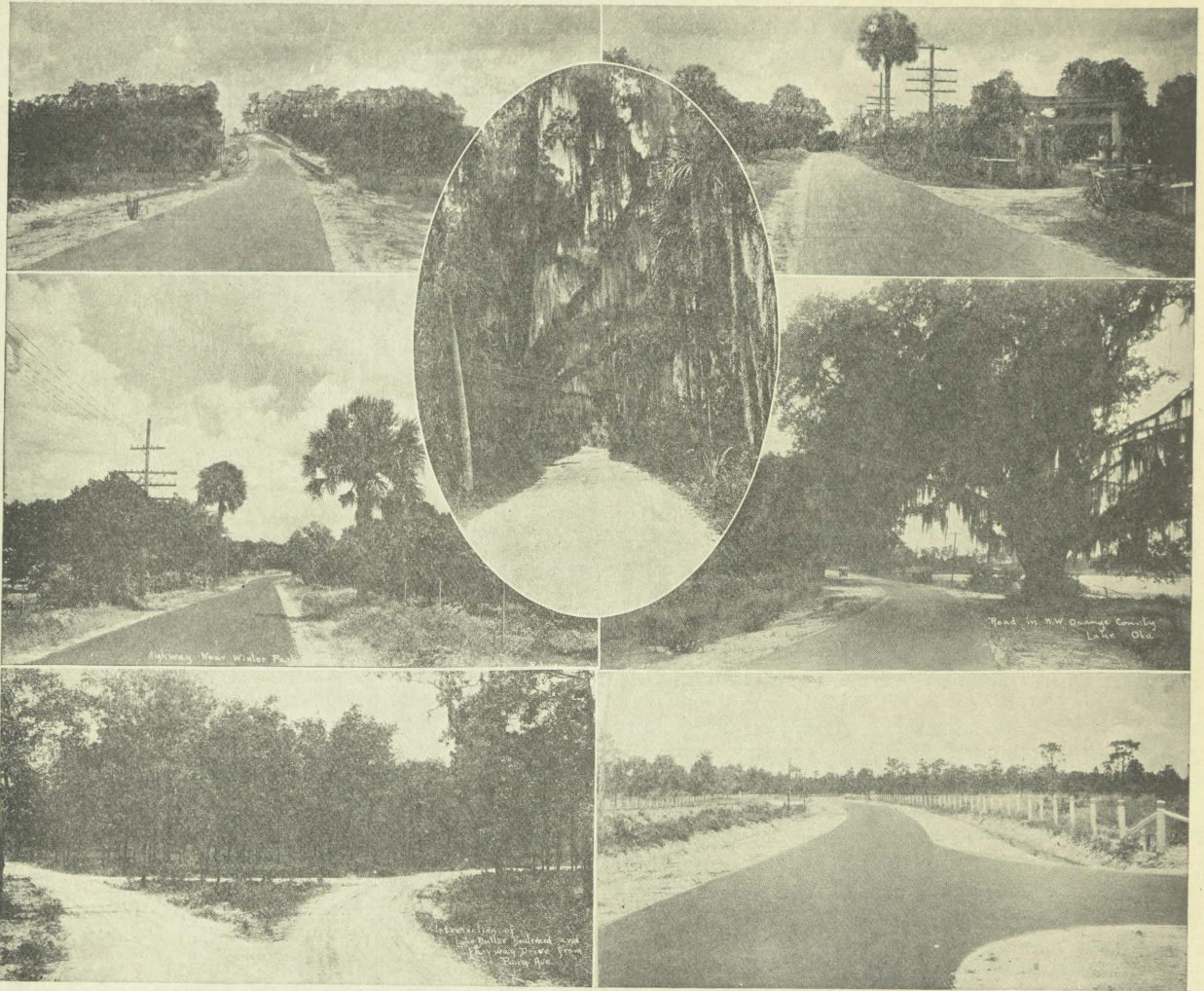
### GREAT PROGRAM OF GOOD ROADS CONSTRUCTION SOUTH

Upwards of \$140,000,000 for new road construction in the sixteen Southern states will be available in 1924 according to reports furnished the Manufacturers Record by the various State highway departments. These figures are for purely State work, and it is conservatively estimated that the county funds for highways will equal if not exceed funds for State work. In addition, the amount of money to be expended for paving in cities and towns will reach a big total. Thus, \$375,000,000 is not an overestimate of the amount of money available this year for highway improvements.

In addition to funds now actually ready for use, campaigns are under way in several States for big bond issues to carry road work forward. Likewise many towns, cities and counties in all parts of the South are planning to vote this year on bond issues calling for the expenditure of millions of dollars for improved roads and streets. States that have voted big bond issues and have road construction under way in volume are already considering voting additional funds. Large sums will also be available in those States that have during the recent past inaugurated a "pay-as-you-go" plan of financing road building through a tax on gasoline.

Besides the large amount of money involved in road construction, paving and maintenance, proportionately heavy investments are being made in bridges and viaducts. The continued great increase in traffic has made necessary the construction of costly viaducts in a number of the larger cities. Some of these structures are now under way and others will be started in the next few months. Large sums are being spent in eliminating grade crossings





Scenes along Orange County's beautiful highways. Upper Left—Highway among Orange County hills. Center Left—Highway near Winter Park. Lower Left—A velvety sand-clay road near Windermere. Upper Right—Entrance to home of Irving Batcheller. Center Right—A great oak near Tangerine. Lower Right—Part of Orange County's fine highway system. Center Oval—The beauties of a Florida road.

#### LET'S BEAUTIFY OUR GOOD ROADS.

(Continued from Page One)

beautiful tree is the enemy of God and man. What then, can we say for one who sets the woods afire and burns down hundreds of trees simply for the sake of ranging a few cows over the land which does not belong to him, cows that are worth so little to him or anyone else that it would take hundreds of them to equal the value of a great tree from any angle one might compute the cost. Let us do our best to save the trees in the open country.

#### Destroy Unsightly Signs

Second, little progress can be made in highway beautification so long as men are permitted to clutter up the landscape with unsightly signs. On one stretch of eight miles of the Dixie Highway in Florida one finds nearly sixty signs advertising someone's cure for chilblains and malaria. An inspiring and memorable sight for the eyes of the residents and the tourist.

Most highway sign posting is expensive and poor advertising. One hundred dollars spent in legitimate

newspaper advertising is worth more than \$1,000 worth of sign posting.

Recently in Orange and Lake Counties, Florida, more than 5,000 unsightly signs have been removed from the highways by the road crew and other good citizens. The highways belong to us all and each one of us has as good a right to take down unsightly signs on the highway as some one else has to put up such signs. If a few hundred more good citizens would stop and take down these signs along the highways we would soon see great improvement in all parts of our state.

A few weeks ago the Orange County beautification commission notified an oil company which had been posting the streets and highways of the state with their signs that the sentiment in this county was against that sort of defacing the highways and that it was certain to hurt the sale of that particular brand of oil more than it would help it if they posted Orange County as they had some neighboring counties. The commission received an immediate reply to their protest from the southeastern manager of the company saying that they did not understand the



sentiment of the people and that they certainly would not spoil our highways with their advertising matter. A letter of the right kind to the advertiser will usually get relief.

Third, the county commissioners should at once settle on the width of the highway and this information should be given wide publicity. Our commissioners set the fence line at twenty-five feet each way from the center of the road, giving a fifty foot right of way. The people were notified through the press some six months ago and during that time some forty-five miles of fences have been set back to this line and new fences set where they should be. Many owners have replaced old fences with new and attractive ones, some have painted the fences white and at least one has used more colors.

Fourth, a program of tree planting is what we need in all parts of our state. It would be a simple and inexpensive thing for us in Florida to set 10,000 fine trees a year for the next ten years along our main highways and a program of that sort would transform many sections of our state in a few years. By a little concerted effort we could plant 100,000 good trees a year for ten years and then we would have something of which we could be proud.

Fifth, while we must plant trees, tens of hundreds of thousands of them, we can also do good work in supplementing these plantings with certain shrubbery and flowers. Oleanders, periwinkles, star jasmine, cherokee and Macartney roses and many others are available.

#### How to Proceed

In Orange County we have learned a few things about the method of procedure in going about this program of highway beautification. Every day we find there is more for us to learn, but it may be that our brief experience will be of some value to the rest of the state.

The first step is to organize the forces. In Orange County this was done through the appointment of a committee from the Orlando Chamber of Commerce after an inspiring appeal made by that veteran of good roads enthusiast, H. H. Dickson. This committee was later enlarged by the addition of representatives from various sections of the county until now every community is represented on the commission. These representatives organize by the election of a president, vice-president, secretary and treasurer. A regular monthly meeting of the commission is held and such special meetings called as occasion requires. The commission is subdivided by assigning definite responsibility to certain members for each of the twelve projects outlined for the first work to be done.

Second, it is important to get competent advice and we are convinced that it is neither necessary nor wise to go outside the State of Florida to get the professional advice and suggestion needed. It is far better to use our own Florida talent. We have men within our state who are thoroughly competent and our commission is now working through one of these men.

Third, it is necessary to arouse public sentiment. I have never known of a subject in which it was so easy to interest the public as the program of highway beautification. The moment the people understand what is intended and how it is to be done they rally enthusiastically to the proposition.

The fourth step in the procedure is the financing of this proposition. We have learned that it is possible to spend a lot of money and get very little concrete and efficient results. Highway beautification does cost money if it is to be done well. In Orange County we have a far-seeing board of county commissioners who have appropriated \$3,000 for this year's work. In addition to this we have twenty-one business men and firms in Orlando who have subscribed \$10 a month for a year and six others who have subscribed \$5 a month for a year for this work, fifty per cent of it to be spent within the city of Orlando and fifty per cent in the county outside the city. The commission finds it necessary to retain a competent landscape engineer and to employ a gardener who devotes all of his time to this work. We have an unusually good man handling this part of our program at this time. The people will respond with their financial support to the right kind of a beautification program.

Fifth and finally, it is tremendously important that the commission shall get the people to cooperate in the gift of plants and the rendering of definite service. It is surprising the generous way in which the people respond to this sort of an opportunity. One lady gave the Orange County commission more than 5,000 plants, another 2,000, another 1,000. One man has given 1,000 palms, a lady 200 palms. One nurseryman has contributed more than 25,000 plants from his nursery, others have given thousands of cuttings of oleanders, hibiscus, bignonia, star jasmine, cherokee and McCartney roses, etc. A conspicuous example of the sort of thing that can be accomplished in this work is seen in the activity in the Conway section, where M. J. Daetwyler gave 25,000 petunia plants, the community council did the work of transporting these plants from the nursery and resetting them inside the fences next to the groves along the main highway. More than 30,000 cuttings of various sorts have been rooted and are ready for transplanting along our highways. At one point the plan calls for a half mile of rose highway. At another point a half mile on which the steep sides of the cut along the road will be covered with bignonia. At least a thousand oaks will be planted on our highways during this present year. In addition to this there will be shrubbery and flowers of many varieties.

We have just started the program in Orange County, but we have started. We expect to continue until we have multiplied many fold the attractiveness of our 663 miles of hard surfaced highways built and building in this county.

#### ROAD BRIEFS

The Tribune congratulates Glades County on the decision of its commissioners to call an election for a \$275,000 good roads bond issue. Nothing is more needed to put that county properly "on the map" than road building and improvement. The bond issue proposed will complete a paved road across the county from the Palm Beach to the Highlands County line, thus affording a thorough route from the East Coast to this section of the State. It will pass through Moore Haven and Palmdale and also afford a connection via Palmdale with the county

(Continued on Page Sixteen)



## Federal and State Policies in the Construction of the Federal Aid Highway System

Address before American Association of Highway Officials, New Orleans, December, 1923.

By T. H. MacDonald, Chief, Bureau of Public Roads.

In November, 1921, the Federal Highway Act became a law. In the two-year period since, in addition to administering very large programs of highway construction and maintenance, the State highway departments of the 48 States and the Bureau of Public Roads have selected, correlated and agreed upon the highway system which is to be first improved under the terms of this act. This is truly a noteworthy accomplishment. It is at once a promise and an assurance of progress in the development of adequate highways for this nation. There is the appeal of something fine, the challenge of security in our form of government, in the successful planning of this great system of interstate and inter-county highways, through the joint effort of the sovereign States and the Federal Government, each recognizing the aspirations of the other.

Other nations have in times past built great road systems under military dictate, largely for purposes of conquest. The United States plans a system of highways to serve her people in the pursuit of economic freedom and happiness. As now visualized in the first real map of the major system of highways, the conception is truly national, but like all other of our great national institutions the scheme has been built from the foundation up and not from the top down. We, of the Bureau of Public Roads, are proud of this national plan, yet we most cordially and gladly give the credit for its accomplishment to the State highway departments.

The choosing of such a system has been a most difficult task. That it has now been brought to a successful conclusion is largely due to the selective processes which the highway departments have been exercising for years. Without this prior classification, which has been the cause of constant and vigorous protests where local and often selfish interests recoiled against the action of the State departments, the welding of a great network of major highways covering the whole nation into a comprehensive plan could not have been possible. The recent task largely narrowed to a process of joining the selected systems of the States, and here again the departments have shown a wonderful spirit of cooperation. Conflicts at State lines have been settled in friendly conference around the table. It is more than evident that the highway departments and the field organizations of the Bureau have carried on the negotiations with sincere good will and mutual respect.

The task ahead is defined. It will be completed.

The present map includes 168,881 miles in the Federal aid system, about 30,000 miles less than the legal maximum based upon the certified total public road mileage in the United States of 2,886,061 miles. While there remain some details yet to be adjusted, they are in the main relatively unimportant and will not be allowed to cause controversy between the

States and the Bureau. Only in one case was it necessary for the Secretary to hold a hearing before making his decision, and this was sought by an Association having no official status. I am convinced by the experience in this matter that no State highway department should accept financial contributions from any source outside public revenues unless no obligation, actual or implied, is thus incurred. That which may appear to be the proper course to follow today may not be in five years or less. Conditions in the highway field have undergone the most abrupt and unforeseen changes. Each highway department must remain free, morally and legally, to follow the course dictated by the most urgent needs of highway service.

The State and Federal governments are financially able, and the State and Federal highway departments are administratively and technically competent to build the roads in the order of greatest importance in the different sections of the country without the assistance of any voluntary organization, if it in the end shall become a source of embarrassment.

As indicative of the task ahead, the combined mileage of State systems as of January 1, 1922, is 220,000 miles. Of these, 80,200 miles are reported surfaced, or 36 per cent. The Federal aid system now approved is about 80 per cent of the total State highway mileage, and may be considered to this same extent coincident. Applying the same pro rata of improvement the first of the year 1922, about 30 per cent of the Federal aid system was surfaced, or about 50,000 miles. Of Federal aid highways on July 1, 1923, there had been completed 26,536 miles, and there were under construction 14,771 miles, a total of 41,307 miles of all types. Of these 8,686 miles were graded and drained, and 32,621 miles surfaced. All but a very small percentage of this mileage is on the Federal aid system as now established, and although, admittedly the above figure of 50,000 miles of surfaced roadways on this system is very rough, still it is apparent that the surfaced improvements added in the four-year period 1920-1923, have been equal to or greater than all the surfacing placed in all the prior years.

A careful study is being made, State by State, of the improvement status of this definite Federal aid system. If these estimates are found to be approximately correct, at the end of this year there will be about 60,000 miles of surfaced roadways, and about 8,700 miles graded. This leaves 110,000 miles to be surfaced. To surface this mileage in the ensuing decade, that is, by 1934, there must be an annual program of 11,000 miles of completed new construction. In addition, there must be the "stepping up" of many miles of lower to higher types, the reconstruction of surfaces built before the present traffic, and the widening of roadways to carry the increased



traffic. During the ten-year period there necessarily will be added a considerable increment to the present approved mileage.

Nor does this yet represent the size of the essential construction program to bring this major system up to a satisfactory operating basis in the next ten years. There are many miles of the system crossing Indian reservations, National Parks and National Forests in our western and southwestern empire. There are many new and important bridges required and a large program of bridge reconstruction, especially in the east and south. Added to all this is the ever increasing need of safety improvements, such as the elimination of railroad grade crossings.

These and similar problems are not to be indefinitely deferred. They must be met. From the standpoint of financing new construction, the most acute situations exist in a number of the western States. The new map shows the extensive network covering the eastern and Mississippi Valley States, focusing in a few lines east and west across the Rocky Mountain system, the great central plateau, and the Sierra Nevada system, finally to meet and multiply into the highways of the Pacific Coast States. While limited in number, these in-between connecting links present serious problems, financial and engineering—not through an unbroken length, but at times for long distances, where there is little or no local development, where the physical obstacles to road construction are unusually difficult, or where these necessary links are not so located that they, at the same time, serve the most urgent highway service needs of the communities or the whole State.

The sliding scale of financial cooperation does not meet these conditions. It alleviates, but does not cure. The agricultural depression has hurried the acute status, it is not the cause. The Bureau understands

this condition and is in sympathy with its proper solution. This right solution can and must be found. There can be more than one approach. A readjustment of the scale of cooperation to meet specific extraordinary conditions, the general development of more economical design or construction. With the existing status of construction, both as to types and extent, Federal participation in maintenance as a general policy is not the logical solution.

### Highway Traffic

The indicated necessary improvement program on the major highway system is large. It must be considered most seriously, but in the light of the amazing growth in highway traffic.

Economic data is becoming available by which we may measure the need for, and usefulness of, improved highways with certainty, and the conclusion is inevitable that the annual mileage of new roads is lagging behind the expansion of highway traffic. Highway transport is seeking to serve more rapidly than the handicap of inadequate highways is being removed. The State Highway Department of California and the Bureau have made two traffic studies covering the State system, the first in 1920, the second in 1922. At the same one hundred three counting stations, the two-year numerical increase in daily traffic was 47 per cent, thus closely reflecting the 54 per cent increase in registrations.

The Baltimore milk transportation survey shows 36 per cent of the city's supply now brought in by motor truck. In 1919 only 18 per cent reached the city in this way.

The Connecticut highway transport survey developed beyond question the fact that the direct connections between population centers are the major



Kentucky Rock Surface on Alapaha River Bridge, Road No. 2, Hamilton County.



traffic lines, that the traffic is reasonably proportional to the population concentration in the centers directly connected, and that the heavy traffic both in weight and number is restricted to a relatively small percentage of the total mileage of public roads within the State.

The Bureau's predicted total registration for this year is 14,700,000, and for the following year 16,500,000 plus. The extension of freight and passenger lines is bringing rapidly to the individual, highway transport service, whether he is a car owner or not.

The report of Special Committee IV of the United States Chamber of Commerce on the "Relation of Highways and Motor Transport to other Transportation Agencies" states as one of its major conclusions:

"Trunk highways in any area should be able to carry the normal vehicular traffic of that area, and, if the traffic economically justifies the use of especially heavy trucks, highways with stronger sub-bases must be provided. This constitutes a problem requiring particular attention in the design of highway systems and in the regulation of traffic. In other respects present types of highways, present routes connecting principal centers of population and production, and the present trend in size, weight and speed restrictions of vehicles using highways show a rational system of highway development that should be continued."

Highway traffic presents a cross section of the business and social life of the communities. Upon this fact and the definite traffic data now being gathered may be predicated the character, amount and weight of the traffic which the highways should be designed to carry.

The results of the California and Connecticut transport surveys will be available soon. The Bureau is now cooperating with Pennsylvania in similar traffic studies, and desires to work along these lines with other States as the funds available permit.

### Highway Funds

There is a large discussion, much of it critical, of the expenditures for highway purposes. There is particular criticism directed against bonds to pay for the improvements. The tendency on the part of the uninformed and unthinking is to condemn expenditures for such purposes because they are, in and of themselves, large in amount. They forget that no one can pass upon the reasonableness and necessity of a public outlay of money without considering at the same time the utility and value which is brought to the use of the public because of such an expenditure. It is just as logical to judge the soundness of a business concern by looking only at the liability side of its statement without comparing it with the asset side, as it is to criticize expenditures for highway construction without taking into account the value of service which such highways render, *i. e.* their earning capacity. We have recognized for years the terrific annual loss of mud roads and the possible savings, direct and indirect, which accrue to the users of improved roads. A milk truck taking the milk of a certain group of farmers to the Baltimore market had to operate over a 5-mile stretch of unimproved road to reach a surfaced road. The regular

price of transporting milk is 3 cents per gallon. In this case the operator of the truck charges his farmer patrons 1/2 cent per gallon extra for the six-months period from October to April because of the bad road conditions. Those farmers are actually paying \$900 annually more than the regular charges, or \$180 per mile, or the interest at 5 per cent on \$3,600 per mile. This is the actual increased cost for milk alone. Considering the other traffic which exists, it would be good economy to borrow the money if necessary to improve that road. There is good reason to question the sincerity of these self-constituted "watch dogs" of public funds, who set in motion propaganda against highway expenditures and are silent as to the net savings resulting from them.

In 1921 the Bureau made a thorough survey of all highway expenditures. The results are illuminating. Of the total \$1,036,587,772, there was expended by or under the State highway departments \$413,241,662, or 40 per cent, while under local authorities there was expended \$623,346,110, or 60 per cent. These expenditures were divided as follows:

#### EXPENDITURES—1921.

##### By or under control of State Highway Departments.

State and State-aid construction.....	\$291,973,813	70.7%
State and State-aid maintenance.....	74,526,746	18 %
Engineering and administration.....	18,881,855	4.6%
All other items—(a).....	27,859,248	6.7%

Total, States .....\$413,241,662 39.9%  
(a) Includes payments of interest and principal of highway bonds, purchase of gravel pits, quarries, etc.

#### LOCAL EXPENDITURES—1921.

Construction all classes .....	\$334,991,560	53.7%
Maintenance .....	174,066,423	27.9%
Engineering and administration.....	17,149,498	2.8%
All other items—(a) .....	97,136,629	15.6%

Total, Local .....\$ 623,346,110 60.1%  
Grand total expenditures, 1921...1,036,587,772 100 %  
(a) Includes payments of interest and principal of highway bonds, purchase of gravel pits, quarries, etc.

Remembering that on the basis of a billion-dollar highway program, the division is 40 per cent expended by the State and 60 per cent by the local authorities, note the division of income for all highway purposes.

#### TOTAL INCOME FOR ALL RURAL HIGHWAY PURPOSES—1921.

Bonds .....	\$ 438,109,273	38.1%
Taxes .....	415,680,010	36.2%
Motor Fees .....	118,942,706	10.3%
Gas .....	3,683,460	.3%
Federal aid and forest funds.....	79,333,226	6.9%
All others .....	93,689,221	8.2%

Grand Total .....\$1,149,437,896 100 %  
\*From State reports.

Property taxes contribute direct 36 per cent. As closely as can be estimated, this is about 10 or 11 per cent of the total annual tax bill, local, State and Federal.

Therefore, if there had been no highway program, State or local, property taxes would only have been reduced by say 11 per cent.



Examine now the division of income for State funds only.

INCOME TO STATE HIGHWAY FUNDS—1921.

State bonds and special assessments..	\$114,825,637	28.3%
State taxes, direct .....	46,206,583	11.4%
State appropriations from general funds .....	20,817,354	5.1%
Funds from counties, etc.....	29,302,653	7.2%
Motor vehicle fees .....	101,284,479	25.0%
Gas tax .....	3,273,988	.8%
Federal aid and forest funds.....	79,333,226	19.6%
Miscellaneous sources .....	10,494,479	2.6%
		\$405,538,399*

\*There is an apparent discrepancy between State income and expenditure, but it should be remembered that in the conduct of public business, the two are ordinarily not exactly coincident or correlated. The discrepancy here is less than 2 per cent, a most excellent record.

Crediting general property tax with both State taxes and funds from counties, the total is 18.6 per cent. The items of Federal aid, forest funds, motor vehicle and gas tax, total 46 per cent, and State bonds 28.3, *i. e.*, 73.7 per cent outside direct property taxes. The information is not available to divide the bond retirement and interest between property taxes and motor vehicle and gas taxes.

This is the real truth. The local roads are the cause of property taxes for this purpose being higher. This clamor about taxes is directed at the wrong cause.

These figures are for 1921, the increase in revenues from the motor vehicle and gas taxes are growing rapidly. The total 1921 revenues from this source, including Federal taxes, were more than \$350,000,000 equal to 85 per cent of the income to State highways. It exceeds the entire tax bill of the railroads.

The Federal Government has received in taxes on the motor vehicle and repair parts more than double its entire expenditure for Federal aid.

The greatest danger we face in completing the Federal aid system or the State systems, are the drives against these funds for local roads, and even for purposes having not the most remote relation to highway improvement. The very life of the highway departments and major highways program depend upon these revenues.

This is the stern fight ahead. Property taxes can and should pay for the local program until the major one is complete, and if property taxes are too high the local program of new construction can be smaller for the time.

From this general discussion of the present situation, and from the experience in each State, the conclusion is certain that the improvement of the Federal aid highway system is the most important big task ahead, not because it is the Federal aid system, but because it comprises the most important inter-State and inter-county highways of the nation—the very frame work of the whole structure, and that with its improvement heavy traffic will more and more concentrate on it, thus relieving other roads. But that no matter how important this may be, there will be determined efforts to divert the necessary funds to roads of lesser traffic importance, but totaling a much larger aggregate mileage. Even though well begun, the big work of the State highway depart-

ments and the Bureau has only just begun. There must be established closer and more sympathetic understanding, and in this the Bureau desires to meet the States more than half way. The public is impatient. It is demanding increased highway service, and this service can only be rendered by better maintenance, by as large an annual program of construction of roads suited to the needs as the funds will permit, by better construction, and by reducing costs. These objectives can only be accomplished by more efficient administration and engineering, now made possible by the great advance of highway engineering. Each State has its particular problems. If some States have larger available revenues, they too have the heaviest traffic problems. There are plenty of thorns with roses in all the States.

### Maintenance

Sometimes questions that come to me indicate a feeling that the Bureau is inclined to deal narrowly in approving Federal aid projects, but such is not the case. The Bureau desires to meet the States on the broad basis of faith that the expenditure of Federal appropriations for road purposes is an investment which will return many fold in measurable benefits. Objections are raised if the proposed construction appears unsuited for the traffic service demanded or that the maintenance will be difficult or impossible, and the costs will be unnecessarily high.

Under the law the Bureau cannot participate in the expense of maintenance. This expense ought to be met from the revenues from the motor vehicle license fees and the gas taxes imposed now by 36 States, *i. e.*, the road user. Proper original construction will do more to decrease maintenance costs than any other factor, and the Bureau will meet the States to the fullest extent compatible with the law to secure such construction.

There are supplementary practices which we consider desirable, for example, the seeding of embankments and side slopes of grades, and other work calculated to protect and thus decrease maintenance costs.

It is our judgment that the limitation now imposed on the allowable participation per mile should be removed to enable participation on paved roadways on heavy traffic roads not less than 20 feet wide. While 18 feet is regarded as sufficient for two way traffic, the 20 foot widths are already indicating a lessened maintenance cost and a more usable width.

### Stage Construction

The proper balance between maintenance and construction costs is one which each State may not always determine on its merits. Many States have been forced to build roads of lower types because of lack of funds and a demand for a larger mileage than is justifiable from the maintenance standpoint but necessary from the standpoint of traffic service to the public.

The stage construction policies of the Bureau seem not to be understood in some States. The Bureau is willing to approve stage construction and the most economical types or processes that it is possible to devise, whether these are regarded as standard or not.



The stage construction policy is sound and practically all of the road work in the United States may be regarded on this basis now, since it has been definitely proven possible, assuming the original alignment and grades are adequate to build up existing types to meet increased traffic. We need to extend this policy and to develop new designs. Processes ought to be simplified, and we are ready to meet economies of this character even to the extent of extending project agreements to cover more than one construction season. For example, there are many roads which for lack of funds have been only graded and drained which would be greatly improved by the addition of sand where the traffic is not too heavy and where the soil is of clay and gumbo types. There are many miles of such roads in the great agricultural States of the Mississippi Valley. This material could be applied in thin layers through say two construction seasons until a maintainable surface is built. The same policy could be followed in building gravel roads where the material is of the fine type and where water and rolling add undue expense. The stage construction policy must be carried out in good faith. The Bureau regards as real contracts the grading projects approved for later surfacing. There is a real danger in extending grading and draining too far ahead of the final construction, and already this situation exists to a limited extent. Lack of funds to build as original construction a suitable type for the traffic is the only possible reason for the use of the stage construction where the improvement does not extend beyond grading and draining unless there is sufficient clearing or time is needed to allow the settlement of high fills. The greatest danger in stage construction lies in the possibility of not being able to secure funds for higher type surfacings where actually needed.

### Subgrades

The character of the subgrade has a very large effect upon the stability of the road surface. The difference between good and poor subgrade materials has long been recognized. It is a more difficult matter to decide where the boundary line exists between a bad soil and one that will provide adequate supporting power under any moisture condition. Recently the Bureau has placed a memorandum before the district engineers calling for subgrade treatments of plastic soils, such as the clays and gumbos, before placing high type surfaces. The practice already exists in some States of stabilizing the subgrades where bad soils are encountered before building the surface, and this practice should be adopted generally.

There is need for cooperation between the Bureau and the States in establishing the relation between field behavior and laboratory analysis. It is believed that very simple tests will determine the soils which should be modified before surfaces are placed and that the treatment itself can be of a simple, economical type. Silt and sand are both effective. Recently the Bureau tested the effect of the addition of Portland cement to a clay subgrade with marked results. One part of cement was mixed with 28 parts of soil to a depth of one foot. Concrete slabs six inches in thickness were laid on this subgrade, and corresponding concrete slabs were laid on an untreated subgrade. The slabs were then tested under

impact simulating truck action. The slabs on the cement treated subgrade broke under loads which created a pressure under the wheel of 18,000 pounds, while the slabs on the untreated subgrade broke under a pressure of about 12,000 pounds. The bearing values of the treated soil showed great improvement and when mixed with water had apparently lost its plasticity, while the untreated soil was plastic. Similar results can be obtained with the use of other materials.

It appears that with very simple but intelligent methods, the stability of bad soils may be materially increased at an expenditure very small relative to the results that may be secured in the addition to service life of the completed roadway.

### Railroad Crossings

Generally speaking, the States are fully cooperating in the elimination of grade crossings on new construction. From the records of the Bureau, out of a total of 753 crossing which have been eliminated, 467, or 62 per cent have been eliminated by relocation, 286, or 38 per cent by grade separation. In spite of the progress along this line in the work that has already been done to bring about a separation of grades, there still exist many grade crossings on important traffic routes. It appears reasonable and advisable that each State should adopt definite policies fixing an annual program of crossing elimination or of improvement providing for more adequate protection and safeguarding of the public.

In dealing with a problem of this kind it is always better to secure adequate data for each crossing. The Bureau will very gladly cooperate with each State in the examination of the crossings now existing on the Federal highway system to the end that a proper classification of these crossings might be made and a program of improvement or elimination set up. The railroads constitute a third party which should be taken into consultation since they must participate in such a program. It is difficult to fix upon an annual program which would, within a reasonable length of time, eliminate this source of danger from our principal highways without definite information as to its full extent. There is no reason why such a determination might not be made independently of the progress of the construction program, as there is no reason why the improvement of such crossings should not be taken up as single projects without waiting for the construction of the roads on which they occur. Unless a policy of this character is established it is more than likely that the most dangerous crossings will not receive prior attention.

### Safety and Accidents

While the grade crossing problem is one of the most serious, there are many accidents occurring which are not a product of this cause. Upon inquiry, the Bureau finds that only eight States attempt to keep a complete record of accidents occurring on the highways. These States are:

Connecticut	Rhode Island
Indiana	Vermont
Maryland	Virginia, and
Massachusetts	Wisconsin





Bridge over Little St. Mary's River; Federal Aid Project No. 21-B. Length about 340 feet.

In these States the automobilist is required by law in case of an accident to make a complete report to either the Commissioner of Motor Vehicles, the Commissioner of Highways, the Secretary of State, or to the nearest judicial official. In general, the laws also provide a penalty for failure to make such a report. In some of these States the report forms include typical sketches of the location where the accident occurred, and information as to its occurrence on a curve, reverse curve, tangent, road intersection, etc. In certain States additional information is obtained from highway patrolmen and from maintenance men, and from other local highway employees.

It appears to be very important for the States to have complete data covering this matter of accidents so that it will be possible for those in authority to take the proper steps to eliminate causes which are directly attributable to the physical condition of the highways. In the main, accidents should be classified as to their results (number dead, number injured)—time (daylight, darkness)—location (rail-road grade crossing, intersecting highways, tangents, curves, grades, detours) and cause (faulty operation, faulty equipment, weather condition, highway condition). These elements of the cause of accidents can be split up into greater details. For instance, under the heading of highway conditions, there should be a notation of lack of sight distance (forward or horizontal), a narrow highway, a narrow bridge or culvert, inadequate, irregular or improper wording or spacing of signs, lack of guard rail to outline roadway and warn motorists, unnecessary obstacles to view, failure to make prompt repair to holes or depressions in the pavements, excessive crown. There may be other elements of the physical condition of roads which should be inquired into in case of highway accidents.

### Field Inspection

It appears that preliminary engineering and designing have moved far ahead of the field control of actual construction operation. The importance of adequate and competent field inspection cannot be over-stressed. This should extend to field tests of material which can be checked by the headquarters laboratory. There has been a great improvement during the past three years, and most of the States recognize the importance of competent field inspection, but there is still a tendency to economize on personnel to such an extent that adequate engineering inspection is not always given.

This inadequate inspection extends to bridge construction. Both the Bureau and the States should strengthen their work in this regard, and should resort to new methods of inspection that will more adequately secure a compliance with the plans, specifications and contracts. The use of a light sounding hammer for testing reinforced concrete bridge construction has proven the presence of poor concrete where surface indications were reasonably good. The profilometer developed by the Illinois Highway Department provides a possible means for testing the surface secured in pavement construction and its proper use will result in higher standards of workmanship. The use of coring machines should be greatly extended. The general use of this machine to check the compliance with contracts in North Carolina is highly commended, and the results secured should lead to the universal adoption of this plan of determining not only the adequacy of the engineering control in the field, but of providing a method for settling with contractors on the basis of actual work done. The Bureau will cooperate with the States in helping to operate this equipment to any extent desired.



### Laboratory Control of Materials

Undoubtedly each State should establish its own testing laboratory. There has been such a demand upon material sources that too often the laboratory examination of materials has been only a paper compliance. That is, the information secured has had too little effect upon the materials actually going into the construction. The responsibility for the use of proper materials extends beyond the program under State control. Local authorities would be assisted if the results of tests were made known. For example, on one Federal aid job a sand was rejected which had already been used on over 300 miles of county roads. The plan of having the testing done at university laboratories cannot be relied upon for any considerable paving program, nor can a commercial laboratory compete with the service rendered by a properly equipped testing division. Just half of the States are now operating State laboratories, the others being dependent upon the commercial or university laboratories. The inspection of materials at their source is highly desirable, and this plan is used by some States. There is no reason why cement, for example, should not be tested at its source, and cooperation between adjoining States purchasing from the same mills might well be established with resulting economy. Material surveys would develop new sources of materials, and if these surveys are followed by testing the materials, the State has at hand the information on which to base its construction program. The Bureau has established in each district a material engineer, and we hope to develop a helpful service to the States in this manner.

### Detours

Traffic service must be maintained during construction. It must be given greater attention. The policy of maintaining parallel routes by the State, depending on the contractor to maintain driveways only when on the right of way under construction, as used in North Carolina and other States, is probably the most satisfactory practice. The maintaining of detours is a proper expenditure from Federal aid funds.

### Traffic Regulation

This Association must undertake at once leadership in developing uniform traffic regulations.

### Developing the Organization

One word in closing about personnel training. Fundamentally, the highway problem remains one of education. The men who come after us must be better trained. The organizations must be fed from the bottom with keen, intelligent young men. They must have a chance at broad development in the various branches of the work. They must at the same time get their minds in tune with the spirit of public service.

The record so far is clean. Let us each in his own heart resolve to pass it on, without tarnish, and to the everlasting credit of this Association and its individual members.—American Highways.

The more people step on the gas the higher it goes.  
—Colorado Highways.

Members of the Road Department, the Secretary, State Highway Engineer and Attorney. Photo Taken in front of Department headquarters at Tallahassee at quarterly meeting held January 25-26.



Reading Left to Right—First row, Capt. W. J. Hillman, Live Oak, member 2nd District; W. M. Corry, Quincy, member 3rd District; Ella Creary Thompson, secretary, Judge H. B. Phillips, South Jacksonville, member at large and chairman; I. E. Schilling, Miami, member 4th District; E. P. Green, Bradentown, member 1st District. Back row, B. A. Meginniss, attorney; J. L. Cresap, state highway engineer.



## Business Transacted by the State Road Department at the Quarterly Meeting

The first quarterly meeting of the State Road Department convened at the offices of the Department in Tallahassee, at ten o'clock a. m., January 25th, 1924, with all members present.

B. A. Meginniss, Attorney for the Department, J. L. Cresap, State Highway Engineer, and Ella Creary Thompson, Secretary, were also in attendance.

The minutes of the last quarterly meeting and the special meeting held in Jacksonville were read and upon motion, duly adopted.

### Report of Chairman

The report of the Chairman setting forth the activities of the Department since the last meeting was read, approved and ordered filed.

### Organization

To carry out the provisions of the law regarding the organization of the State Road Department, it became necessary to elect a Chairman and Secretary for the ensuing year.

Upon motion of Mr. Schilling, seconded by Mr. Corry, Judge Philips was unanimously re-elected Chairman of the Department for the year 1924.

Judge Philips upon assuming the chair, expressed his gratitude to the members of the Department for their continued confidence.

Upon motion of Mr. Green, seconded by Mr. Schilling, Ella Creary Thompson was unanimously re-elected Secretary for the year 1924.

### Claim Masters and Mullen Construction Company, Project 3

B. A. Meginniss, Attorney for the Department, and Judge Glenn Terrell appeared before the Department and submitted the following proposal of Masters and Mullen Construction Company looking to the settlement, adjustment or disposition of the claim of said Masters and Mullen for moneys alleged to be due on account of work on Federal Aid Project No. 3, Victory Bridge.

1. That the matter of said claim be submitted for final disposition, adjustment or settlement to Judge Glenn Terrell, B. A. Meginniss, Attorney for the Department, and Y. L. Watson, Attorney for Masters and Mullen.

2. That said gentlemen shall go carefully into the merits of each item of said claim, calling for such evidence as they shall deem necessary to a proper determination thereof. That each party shall have the right to call witnesses in support of any contention, the expense of such witness to be borne by the party calling the witness, and in the event that both parties agree on a witness, the expense of such witness shall be borne by the parties equally.

3. That after full and careful consideration of said claim as aforesaid, said three gentlemen shall make a report of their findings, which said report

shall be final and shall be binding upon said Masters and Mullen and upon said State Road Department.

Upon motion of Mr. Corry, seconded by Mr. Green, the following resolution was unanimously adopted:

Be it resolved by the State Road Department, That the foregoing proposal be and the same is hereby accepted, approved and adopted and that the Chairman be and he is hereby authorized to enter into and execute such agreement or stipulation with said Masters and Mullen as shall effectuate the said proposal.

Be it further resolved, That in the event that the findings shall establish a liability on the part of this Department for any sum, that the Chairman be and he is hereby authorized to pay such amount as may be by said report adjudged to be due said Masters and Mullen Construction Company.

### Project 526, Seminole Bridge

The Chairman reported that a contract had been awarded to the Tampa Sand and Shell Company, Tampa, Florida, for the construction of the fills on the approaches to Seminole Bridge, in Pinellas County, known as Project 526, their bid being lowest.

Upon motion of Capt. Hillman, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the Board does hereby ratify and confirm the action of the Chairman in awarding a contract to the Tampa Sand and Shell Company for the construction of Project 526, Seminole Bridge, Pinellas County, a vote having been given on this project by mail.

### Project 563, Osceola County

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Whereas, Upon canvassing the bids submitted for the construction of small timber bridges on Road 2, Osceola County, known as Project 563, it was found that the one submitted by Ed Pettus, Livingston, Alabama, was the lowest; therefore be it

Resolved, That the bid of Mr. Ed Pettus be accepted for the said work, and the Chairman is hereby authorized to award contract to Mr. Pettus for the same.

### Project 598, Jefferson County

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Whereas, Upon canvassing the bids submitted for the construction of Road No. 1 in Jefferson County, from the Aucilla river to Monticello, known as Project 598, it was found that the bid submitted by the Walter J. Bryson Paving Company, Jacksonville, Florida, was the lowest; therefore, be it

Resolved, That the bid of the Walter J. Bryson Paving Company be accepted for clearing, grubbing and grading the said portion of Road No. 1, and the Chairman is hereby authorized to enter into a contract for same.



**Franklin County, Road 10**

At a meeting of the Department held July 16th, 1923, the matter of paying to Franklin County an appropriation of \$50,000 which had been previously allocated to said county, was referred to the attorney for the Department, to ascertain the legality of such expenditure under a recent Act of the Legislature.

Judge Meginniss reported that he considered this a legal contract and he ruled that the Department is authorized to expend said amount, \$50,000, on Road 10, Franklin County.

**Marion County, Road 2**

Upon motion of Capt. Hillman, seconded by Mr. Green, the following resolution was adopted:

Whereas, The State Road Department of the State of Florida deems it necessary, wise and expedient, to acquire by eminent domain the real estate hereinafter described for the purpose of a right of way for State Road Number Two, in Marion County, Florida, between Ocala and Gainesville, said road being otherwise known as the Dixie Highway; therefore, be it

Resolved by the State Road Department of Florida, That the property hereinafter described is hereby authorized to be acquired by the said State Road Department of the State of Florida for the uses and purposes herein above set forth.

A description of the property hereby authorized to be acquired by eminent domain is:

"Commencing at a point 120 yards west of the southeast corner of Section 23, Township 14 South, Range 21 East; thence west with section line 55.4 feet; thence north 24 degrees, 21 minutes west 2163.7 feet; thence east 49.8 feet; thence southeast with the eastern boundary line of the land of the Ocala Lime Rock Company to the point of beginning.

Also, a strip of land 100 feet in width measured at right angles to the center line, through, over and across the  $N\frac{1}{2}$  of the  $NE\frac{1}{4}$  of the  $SE\frac{1}{4}$  and  $NW\frac{1}{4}$  of  $SE\frac{1}{4}$  and  $SW\frac{1}{4}$  of  $NE\frac{1}{4}$ , all in Section 23, Township 14 South, Range 21 East, the center line of said strip being as follows:

Commencing at a point 1240.9 feet west of the southeast corner of the  $N\frac{1}{2}$  of  $NE\frac{1}{4}$  of  $SE\frac{1}{4}$  of said Section 23; thence running north 23 degrees, 19 minutes west 411.3 feet to point of curve; thence with a one degree curve to left (west) 1221.7 feet to a point of tangent; thence north 35 degrees, 32 minutes west 631.9 feet to a point on the north boundary of said  $SW\frac{1}{4}$  of  $NE\frac{1}{4}$  of said Section 23, said point being 1043.5 feet west of the northeast corner of said  $SW\frac{1}{4}$  of  $NE\frac{1}{4}$  of said Section 23.

The estate in said property hereby authorized to be acquired is an estate in absolute fee simple.

Be it further resolved, That all proper and necessary proceedings for the acquiring of the above described property by such eminent domain are hereby authorized, and the Chairman of the State Road Department of the State of Florida and its Attorney are hereby authorized to prepare and sign all necessary pleadings and affidavits and to take all necessary steps and action required by the statutes of the State of Florida in such cases.

**Lee County**

Mr. G. E. Hosmer, representing the Board of County Commissioners, and various civic and com-

mercial organizations, of Lee County, brought to the Department a cordial invitation to attend the celebration of the opening of the Caloosahatchee River bridge at Ft. Myers, March 12th and 13th.

Upon motion of Mr. Green, seconded by Mr. Corry, and unanimously adopted, the members thanked Mr. Hosmer for the invitation of the various organizations and assured him that as many of the members as can will attend the celebration.

**Project 34, Fulghum Contract**

Upon the Chairman reporting that Mr. S. L. Fulghum had forfeited his contract on Project 34, the following resolution was adopted, upon motion of Mr. Corry, seconded by Mr. Green:

Resolved, That the action of the Chairman in placing the Union Indemnity Company, New Orleans, La., surety on the contract bond of S. L. Fulghum, in charge of construction of Project No. 34, Road 7, Escambia County, is hereby confirmed and ratified, the contractor, Mr. S. L. Fulghum having forfeited his contract on this project.

**Project 36, St. Lucie County**

E. P. Maule Paving Company, contractors on Project 36, St. Lucie County, having requested approval of assignment of its contract for the construction of Project 36, upon motion of Mr. Schilling, seconded by Mr. Corry, the following resolution was adopted:

Resolved, That the action of the Chairman in approving assignment of contract from E. P. Maule Paving Company, for the construction of Project 36, St. Lucie County, to H. L. Clarke Company, Miami, Florida, is hereby confirmed and ratified by the Department.

**1924 Budget**

Upon motion of Mr. Schilling, seconded by Capt. Hillman, the following resolution was adopted:

Resolved, That the proposed Budget of construction and maintenance work for 1924 as prepared by the members of the Department and on file in the office of the Department be and the same is hereby adopted. Be it further

Resolved, That Friday, March 14th, 1924, be fixed and designated as the time and Orlando, Florida, as the place for a public hearing as to said budget of work, at which time and place the Department will hear all complaints and suggestions offered by the public as to any changes desired in said budget.

**Hernando County, Road 5**

Upon motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That the State Road Department pay to J. F. Isom the sum of Twenty-five Dollars for right of way for State Road No. 5, in Hernando County, Florida, over and upon and through the following described tract of land, to-wit:

"A strip of land sixty-six (66) feet wide, the central line of which is the surveyor's line of State Road No. Five (5) now on file and recorded in Plat Book No. 3 at page — of the Public Records of Hernando County, Florida, the said strip of land commencing on the north boundary line of the south half of the southeast quarter of the northwest quarter of Section thirty-three, Township twenty-two, Range nineteen, S. and E., Hernando County, Florida, and extending



South about 25 degrees west to the south boundary line of the above described tract or parcel of land and said strip of land being sixty six feet wide at all points," the right of way to be a strip of land sixty-six feet wide, extending across the above described tract from the north boundary line thereof to the south boundary line thereof, the central line of which strip is to be the surveyor's line of said State Road No. 5 across said tract.

Be it further resolved, That the County Commissioners of said Hernando County are authorized and required to make payment of the above said sum of Twenty-five Dollars for said right of way for this Department.

Be it further resolved, That in the event said right of way cannot be immediately obtained by purchase for the above said sum, that condemnation proceedings be commenced at once, which said proceedings shall be maintained in the name of the State Road Department.

#### Compilation of Laws

Upon motion of Mr. Corry, seconded by Capt. Hillman, the following resolution was adopted:

Resolved, That the Chairman and Attorney be directed to ascertain the cost of compiling the laws affecting the State Road Department and to purchase such number of copies as is deemed advisable.

#### Bradford County, Road 13

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Resolved, Upon canvassing the bids submitted for the construction of Projects 572, 594 and 607, Road 13, Bradford County, it was found that the one submitted by L. M. Gray, Orlando, Florida, was the lowest and the Chairman is hereby authorized to enter into a contract with Mr. Gray for the construction of the base on said projects, and to enter into such agreement with Bradford County as to carry out said contract; and, be it further

Resolved, That the State Highway Engineer be instructed to proceed with this work as soon as the agreement with Bradford County is executed and funds turned over to the State Road Department.

#### Alachua County, Road 5

Mr. M. S. Cheves and Mr. J. T. Price, representing the Board of County Commissioners of Alachua County, appeared before the Department requesting aid on Road No. 5 from High Springs to the Levy County line.

Upon motion of Capt. Hillman, seconded by Mr. Green, the following resolution was adopted:

Resolved, That if Alachua County will appropriate sufficient money to pay one-half the cost of construction of Road No. 5 from High Springs to the Levy County line, the Department will enter into such agreement with Alachua County for the construction of this portion of road as has been entered into with other counties under like conditions.

#### Hernando County

Mr. Hugh Hale and Mr. Fred Stringer, representing the Board of County Commissioners and West Florida Road Association, came before the Depart-

ment in regard to the bridge over railroad at Brooksville and road matters in Hernando County.

No action was taken upon the request to maintain Road No. 5 in that county, but upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted in regard to said bridge:

Resolved, That the matter of changing the bridge over the railroad tracks in Brooksville from a timber structure to a concrete structure be left to the Chairman and State Highway Engineer for determination.

#### Citrus County, Road 5

Mr. C. D. Schultz, Chairman, Board of County Commissioners, and Mr. Scofield, County Attorney, appeared before the Department in regard to Road No. 5, Citrus County.

Upon motion of Mr. Green, seconded by Captain Hillman, the following resolution was adopted:

Resolved, That the Chairman is hereby authorized to formulate an agreement with Citrus County, subject to the approval of the Department.

#### Wakulla County

Judge W. J. Oven appeared before the Department in regard to road matters in Wakulla County.

Upon motion of Mr. Corry, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the matter of aiding Wakulla County, on Road 10, be taken up at the special meeting of the Department in Orlando in March.

#### Levy County

Judge Willis and Mr. Shelton Philips appeared before the Department, asking for aid on Road 19, Levy County.

Upon motion of Captain Hillman, seconded by Mr. Corry, the following resolution was adopted:

Resolved, That the matter of aiding Levy County on Road 19 be considered at the special meeting in Orlando in March.

#### Columbia County

Hon. W. W. Phillips appeared before the Department in regard to an appropriation made in April, 1923, for expenditure on Road 29, Columbia County.

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the matter of appropriation for Columbia County be referred to the attorney for the department, and that the matter be considered at the meeting in Orlando.

#### Taylor County

Mr. T. B. Puckett, Chairman of the Board of County Commissioners of Taylor County, appeared before the Department, asking further aid on Road 19.

Upon motion of Capt. Hillman, seconded by Mr. Green, the following resolution was adopted:

Resolved, That the matter of appropriation for Road 19, Taylor County, be considered at the meeting of the Department in Orlando.

#### Road Signs

Mr. W. J. Adams, representing The Automobile Signal and Sign Co., Chicago, came before the Department, exhibiting a sign made by said company,



and requested that the Department adopt same for use on State roads.

Upon motion of Mr. Green, seconded by Mr. Corry, the following resolution was adopted:

Resolved, That the matter of installing Redflex highway signs be referred to the Chairman and State Highway Engineer.

#### Expense Accounts

Upon motion, duly carried, the expense accounts of the members were ordered paid.

#### ROAD BRIEFS.

(Continued from Page Five)

line at the Kissimmee river. The building of this road will mean a wonderful impetus in the growth and development of Glades County. It will put that county on a main highway from the Atlantic to the gulf and cause thousands of motorists to see that county and its opportunities.—Tampa Tribune.

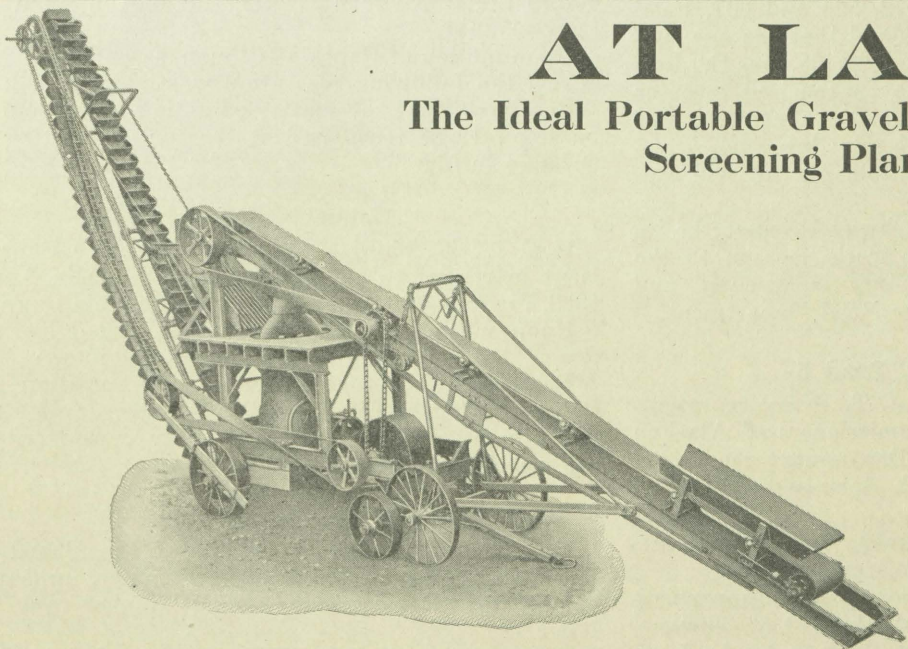
Contractor J. Y. Wilson of Jacksonville started work on the Dixie Highway Monday morning. The work was started nine miles south of New Smyrna, and will progress toward this city. At this time there is a force of thirty-five men employed, and this number will be increased to seventy-five. They have forty-five mules on the job. This contract includes the Dixie Highway from Rose Bay to the south county line. The construction of the Dixie Highway from Port Orange to Sebastian is now in progress,

and when completed will be one of the best roads in the State.—New Smyrna Breeze.

The contract was let recently for the final link in the construction of State Road No. 2 in DeSoto County. The W. R. Wallace & Co. and M. M. Boyd are doing the work, and is now going forward under their direction. They plan to complete the work of grading and installing bridges in 160 days. This is the gap so long delayed in construction in DeSoto County, and is now in a fair way to be finished. This link is seven and a half miles in length, and is the only portion not graded.—Fort Myers News.

Through the efforts of A. Cavalli, secretary of the Chamber of Commerce, arrangements are being perfected with Senator Duncan U. Fletcher and the War Department, to open up the road through Carlstrom Field for automobile traffic. If this is accomplished it will then be possible for the public to enter the south side of Carlstrom Field and motor on a hard surfaced road right into Arcadia. This field has been closed for the last few years, but now that the Government has sold the buildings, etc., the road to connect with the State Road No. 2 should be used for traffic.—Fort Myers Press.

Florida may claim the only road which is out of sight of land but don't New Mexico win for roads which are out of sight of water?—New Mexico Highway Journal.



## AT LAST

### The Ideal Portable Gravel Crushing and Screening Plant

GRAVEL is brought from the pit in wagons, drags or fresnos, and dumped through a trap directly upon the conveyor, which in turn deposits the material upon a grizzly screen. The undersized material drops through the bars of the grizzly upon a chute leading directly to the elevator, while the oversize rolls down the bars into the crusher.

Nos. 2, 3 and 4 Austin Gyratory Crushers can be mounted on trucks and furnished with rigid or folding elevators of the required lengths, and gravel conveyors ranging in length from 30 feet

to 50 feet. Optional equipment includes a revolving screen mounted on a portable bin.

While moving from place to place, the elevator folds down over the crusher; the conveyor is disconnected from the crusher, and its lower end attached to a truck or wagon.

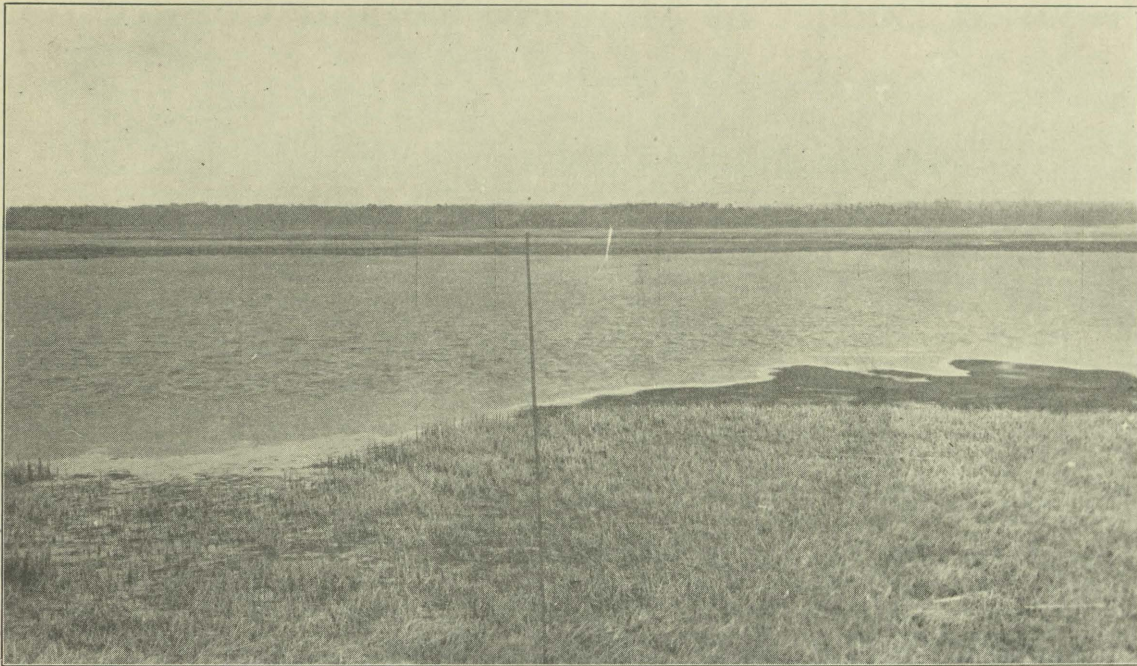
{ A special bulletin describing these portable plants in detail is just off the press. We would like to send you {  
{ a copy. Ask for Portable Gyratory Crusher Bulletin "H." }

## The Austin-Western Road Machinery Company

400 N. MICHIGAN AVENUE—CHICAGO, ILLINOIS

Northern and Southwestern Florida Representative, ROSCOE KENT, Orlando, Fla.  
East Coast Representative, L. D. LEWELLYN, Suite 214, Bedford Bldg., Miami, Fla.





Escambia Bay Bridge Site looking Northeast towards Milton.

## Escambia Bay Bridge

By George L. Derrick, Bridge Engineer

The Escambia Bay bridge, Project 38, is located on State Road No. 1 running west from Jacksonville via Lake City, Live Oak, Tallahassee, Quincy, Marianna, Milton, Pensacola and beyond, to Mobile and New Orleans. The construction of this project will complete the last remaining major bridge structure in Florida on this highway, and in addition serve as a most needed outlet for traffic, both local and through, from Pensacola to the east. The project is located about nine miles northeasterly of Pensacola and on the section of the above mentioned road between Milton and Pensacola.

Little data is available for a satisfactory estimate of future traffic. At present, Pensacola has two outlets to the east, one via Ferry Pass and the ferry, the other via Mobile, crossing the river by bridge and the remainder of the trip to Milton over unimproved roads. One hour is consumed by the ferry, so a much greater portion of the traffic takes the upper route using the present bridge.

Much tourist traffic avoids this section in going east and west and vice versa, owing to conditions obtaining at Escambia River. It is believed, when the Escambia Bay bridge is completed, that it will be subjected to traffic equally as heavy as may be found upon at least 50 per cent of the primary system within the state.

The merits of this project cannot be overestimated in considering both future development of this particular section and transportation from east to west and west to east. This traffic in turn will aid in the development of South Florida.

The proposed project is 3.49 miles in length. A series of bridges will be constructed, these connected by embankment 35 feet in width on top. The width of roadway on bridges will be twenty feet clear. Creosoted timber structures supported by piles will be employed except over the main channel of the Escambia River where steel trusses will be constructed, a total length of approximately 500 feet.

Escambia River being a navigable stream a center bearing swing span supported on concrete substructure will be used providing for a clear channel of seventy-five feet.

Twelve thousand three hundred and eighty-five feet of earth embankment and 4515 linear feet of creosoted timber bridges are now under contract.

### ESTIMATED RESOURCES OF STATE ROAD DEPARTMENT FOR 1924.

Balance on hand .....	\$ 115,000.00
One mill tax .....	425,000.00
Gasoline tax .....	1,700,000.00
Gasoline inspection tax .....	125,000.00
Auto license fund .....	1,500,000.00
Auto title registration fund.....	50,000.00
Federal aid .....	3,776,815.21
<b>Total .....</b>	<b>\$7,691,815.21</b>
Ten per cent reserve for emergency work.....	\$ 769,181.52
Net estimated resources available for road construction and maintenance .....	\$6,922,633.69



# Proposed Budget of Maintenance and Construction Work for 1924

## Construction—Federal Aid Projects—Work Under Construction

Road No.	Proj. No.	County.	Location.	Length.	Road No.	Proj. No.	County.	Location.	Length.
3	18	Putnam	Sisco-Volusia Co. Line	12.80	5	570	Manatee	Bra'town-Sarasota Co.	3.96
1	20	Holmes	Choctawhatchee Br'ge	2.18	1	571	Madison	Greenville-Madison	14.73
2	27	Columbia	Lake City-South	12.36	9	574	Madison	Madison-Ga. State Li.	11.66
4	32	Nassau	Duval Co.—5 Mi. N. of Callahan	10.00	3	575	Putnam	Sisco-Dunn's Creek	5.46
7	34	Escambia	Pensacola-Roberts	10.00	5	576	Sarasota	Myakka R.-Char. Co.	5.68
1	35	Escambia	Pensacola-West	10.00	19	577	Taylor	Salem-Steinhatchee R.	9.50
4	36A	St. Lucie	Vero-Wabasso	7.76	1	579	Holmes	Westville-P. De Leon	8.62
4	36B	St. Lucie	Wabasso-Sebastian Rv.	7.12	19	580	Dixie	Steinhatchee R.-South	10.00
2	37A	Alachua	Gainesville-S. to Proj. 37B	.70	5	583	Hillsborough	Sulphur Sp'gs. Bridge	.03
2	37C	Alachua	Proj. 37B—Paynes Prairie	3.26	24	584	Osceola	F.E.C.R.R.-Deer Park	2.00
2	37D	Alachua	Paynes Prairie	2.14	1	586	Jackson	Marianna-ChIPLEY	17.37
2	37E	Alachua	Paynes Pr.-Marion Co.	7.96	5	589	Lee	Charlotte Co.-Caloosa-hatchee R.	8.27
1	38A	Escambia	Escambia Bay Bridge	3.20	10	596	Leon	Woodville-Wakulla Co.	3.00
4	39A	Brevard	Sebastian Riv. Bridge	.17	4	597	Volusia	New Smyrna-Brev. Co.	16.24
4	40A	Brevard	Sebastian Riv.-Melb.	16.17	1	598A	Jefferson	Aucilla R.-Monticello	9.45
4	40D	Brevard	Titusville-South	6.72	4	604	Volusia	New Smyrna-Rose Bay	7.72
4	40E	Brevard	Titusville-Volusia Co. Line.	13.60	8	605	Polk	Haines City-Frostpr'f.	21.00
				Total, 126.14	13	607	Bradford	Lawtey-Highlands	5.10
					4	608	Brevard	Melbourne-Proj. 554	9.29
									Total, 424.98

## Work Authorized but Not Under Construction

2	37B	Alachua	Underpass S. Gainesville	.37
2	37D	Alachua	Bridge	.01
1	38B	Escambia	Concrete & Steel Br'ge.	.30
4	39B	Brevard	App. Fills Sebastian R.	.26
4	41	Dade	Miami-Broward Co.	11.78
2	43	Marion	Lowell-Ocala	10.44
2	44	Lake	Marion Co.-Leesburg	10.74
1	45	Suwannee	Suwannee Riv. Br'ge.	.17
3	46	Nassau	St. Mary's Riv. Br'ge.	.13
				Total, 3420
				Grand Total, 160.34

## State Projects—Work Under Construction

6	501	Calhoun	Jackson Co.-We'hitch.	41.19
2	503	Charlotte	DeSoto Co.-Lee Co.	8.70
2	505	Columbia	Proj. 27-Alachua Co.	11.80
4	507	Flagler	Bunnell-Reily's Asp.	10.00
29	518	Lafayette	Mayo-Branford	15.00
5	519	Manatee	Palmetto-Proj. 17	3.50
4	521	Nassau	Proj. 32-Ga. State Li.	12.41
15	526	Pinellas	Seminole Bridge Ap'h.	.28
17	527	Pinellas	Safety Harb. Br. Ap'h.	.29
3	532	Volusia	Putnam Co.-DeLeon S.	18.32
24	534A	Brevard	Sta. 308-Sta. 448	2.65
24	534B	Brevard	Melbourne-Osceola Co.	11.81
1	536	Gadsden	Florence-Quincy	5.50
5	539	Marion	Dunellon-Levy Co.	11.30
5	544A	Pasco	Hillsboro Co.-N. to Sta. 462	8.75
5	544B	Pasco	Sta. 462-Hernando Co.	11.33
5	545	Hernando	Pasco Co.-Brooksville	9.51
2	553	Marion	Ocala-Belleview	9.15
4	554	Brevard	Rockledge-5 Mi. South	5.00
6	560	Calhoun	Canal-Wewahitchka	20.00
8	562A	Highlands	Sta. 422-Twp. Li. 35-36	5.37
8	562B	Highlands	Frostproof-Avon Park	10.71
2	563	Osceola	Proj. 2-Polk Co. Br'ge.	.06
5	564B	Charlotte	Punta Gorda-South	7.00
1	565	Madison	Suwannee Riv.-Mad'sn.	15.64
1	568	Jackson	Pope's Lake Bridge	.63

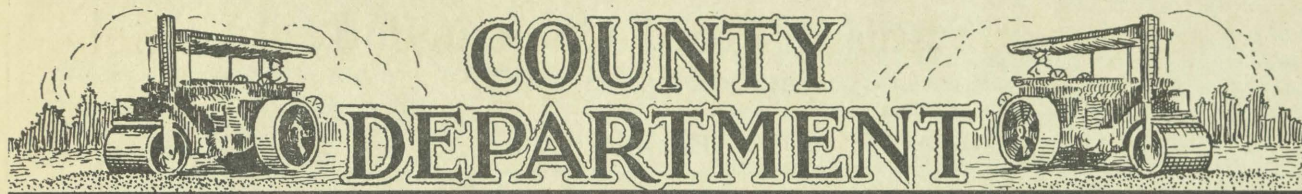
## Proposed Projects—Work Not Under Construction

3		Nassau	Yulee-St. Mary's Riv.	10.50
2		Columbia	Lake City-Jasper	28.06
13	572	Bradford	Starke-Lawtey	7.30
13	594	Bradford	Starke-Hampton	9.10
13	607	Bradford	Lawtey-Highland	5.10
1	598B	Jefferson	Monticello-Leon Co. Line	7.80
8		St. Lucie	Ft. Pierce-Proj. 523	12.00
8	582	Highlands	Kissimmee Riv. Bridge	.59
4		St. Lucie	Bridge at Vero	.01
4	600	St. Johns	Duval Co.-St. Augustine	14.88
1	612	Leon	Jefferson Co.-Tallahassee	17.20
1		Leon-Gadsden	Tallahassee-Quincy	24.00
1		Gadsden	Quincy-Chattahoochee	20.00
1		Jackson	Chattahoochee-West.	25.00
10		Franklin	Blockers' Ferry-Carrabelle	6.16
5	593	Manatee	Manatee Riv. Bridge	1.00
8	562	Highlands		15.00
5		Citrus	Marion Co. Line-Hernando Co. Line	33.00
5	581	Hillsboro	6 Mile Creek-End Asphalt Road	11.00
5		Manatee	Proj. 570-Braden't'n	1.00
5	576	Sarasota	Myakka River-Charlotte Co.	5.68
12		Gadsden	Quincy-Ga. State Line	6.00
3		Volusia	DeLeon Springs-St. Johns R.	20.00
13		Clay	Highland-Duval Co. Line	6.00
				Total, 286.38

## Maintenance of Roads Included in Above Construction Budget and Roads Heretofore Constructed

Division No. 1	233.97
Division No. 2	213.96
Division No. 3	137.00
Division No. 4	210.52
Division No. 5	84.34
Total	879.79





### POLK COUNTY GROWTH AND DEVELOPMENT IS ROMANCE OF HIGHWAY CONSTRUCTION

It is a moot question—something like the one concerning the claims of priority between the chicken and the egg—as to whether the increased production of automobiles and trucks has created the demand for better roads or whether the improved roads lure the people into buying automobiles. The argument seems to be on both sides, particularly in Florida, because once an automobilist gets off a hard-surfaced or otherwise improved road he likely is to become helplessly mired in sand.

But who can resist the call of a straight, smooth, fifteen or twenty-foot asphalt pavement unrolling before him, rising now to the crest of a hill for a glimpse of rolling highlands, silver lakes and well-kept groves, then dipping into a valley and curving gracefully along a shoreline of sapphire water, where sunlight drifts down through gray strands of blowing moss? Here luxuriant vines bury every fence and bungalow beneath a mass of brilliant blossoms that caressingly touch the cheeks with soothing fingers, while there a perfumed breeze that holds the pungency of a hot sun on fresh pine needles and ripening fruit and the sweetness of myriads of flowers, blows pure and fresh across spaces of silvery water. No wonder they buy automobiles in Florida.

Possibly no community in these United States originally was more handicapped on account of its roads than was Polk County, Florida, seven years ago. To understand Polk County's predicament a brief resume of previous conditions need only be known.

The county lies almost exactly in the center of Florida peninsula at a point between one and three hundred feet above sea level. In topography it is a section of rolling hills quite sharply accentuated along the "Ridge" and at Lakeland Highlands, but sloping away toward the southwest into vast stretches of flat pine lands. Its soil includes everything from rich black muck to almost pure sand, though in the main it consists of various degrees of sandy loam. The county has about 600 fresh-water lakes of varying sizes, but they are useless for transportation purposes because disconnected, though kept fresh by subterranean streams.

Polk is an agricultural county. It includes within its borders many towns—about forty in all—the largest of which, Lakeland, has a population of about 12,000. The next largest city, Bartow, the county seat, has a population of 5000. The total population of the county is about 44,000. The county ranks high in per capita wealth and in realty values, and stands third in the amount of automobile license fees paid in the State, being surpassed only by two counties in which there are large commercial centers.

There are definite reasons why an almost strictly agricultural community such as this holds a high place among the counties of Florida and they are to be found principally in its natural resources. In Polk County the finest Florida oranges and grapefruit are produced to the extent of 3,500,000 crates a year. This is two million crates more than any other county in Florida ships, and is about one-third of the State's entire production.

In truck crops and winter fruits, especially strawberries, Polk County stands third. In general farm crop production it heads the list of all counties in the State. In Polk County, too, one-fifth of the world's phosphate is mined, while from surrounding districts is obtained 42 per cent of the total phosphate production. The phosphate mines in Polk County alone are valued at \$19,000,000. Polk County's third great natural resource is its timber, there being vast stretches of pine forests.

In 1915 Polk County was a wilderness and sadly lacking in transportation facilities. Railroads there were but they were operating only to the principal shipping points and the phosphate mines. There were few of them because development did not warrant more. Ten years ago the town of Lake Wales, for instance, had no railroad. Today it has two.

The problem of growing and marketing the fruits and vegetables was particularly trying because of their perishability and the peculiar natural difficulties encountered with the sand roads. Older settlers amuse themselves now telling how formerly it required a day to go from Lakeland to Bartow, a distance of fourteen miles, and return. Now it requires but a half-hour for the journey each way.

It was in 1915 that Polk County people began to realize that the rest of Florida was forging ahead of them and to grasp the reason why. The main streets of the larger towns contained the only pavements in the county. But the Board of County Commissioners that year took matters into its own hands and laid a couple of demonstration stretches of hard surface roads. In 1916 the Board requested and received a bond issue for road building amounting to one and one-half million dollars, the largest single bond issue ever requested up to that time for this purpose in the South. Work progressed rapidly, and by 1919 the original road system of 217 miles designed to connect every town in the county with every other one was completed. The county has grown so rapidly since that time that to keep the new towns connected with each other by hard-surfaced roads there are now 346 miles of paved roads.

The new roads are of sheet asphalt surface, laid on a clay base. To keep the cost down, local products were used almost exclusively in the construction work, the clay being taken from the Bartow clay pits and local soft phosphate rock being used for

(Continued on Page Twenty-one)



## Status of Road Construction

THROUGH DEC. 31ST, 1923.

Proj. No.	Contractor.	Road No.	County	Type	Total Length	Pct. Complete
Fed. Aid.						
18	Morgan-Hill Paving Co.....	3	Putnam .....	B.M.	12.8	99.0
27	C. F. Lytle.....	2	Columbia .....	C.	12.36	53.0
32	State Forces .....	4	Nassau .....	B.M.	10.00	81.3
34	Union Indemnity Co.....	7	Escambia .....	C.	10.00	40.3
35	Hancock Bros. ....	1	Escambia .....	C.	5.0	65.7
36-A	Maule Paving Co.....	4	St. Lucie .....	B.M.	7.76	40.0
36-B	C. F. Lytle.....	4	St. Lucie .....	C.	7.12	4.0
37-A	F. W. Long & Co.....	2	Alachua .....	S.A.	.70	0.0
37-C	F. W. Long & Co.....	2	Alachua .....	S.A.	3.26	11.6
37-D	Fla. Draining & Const. Co.....	2	Alachua .....	G.&D.	2.14	0.0
37-E	Wm. P. McDonald Const. Co....	2	Alachua .....	S.A.	7.96	10.4
40-A	C. F. Lytle.....	4	Brevard .....	R.	16.17	0.0
40-D	J. Y. Wilson.....	4	Brevard .....	R.	6.72	0.0
40-E	Langston Const. Co.....	4	Brevard .....	R.	13.6	0.0
State.						
501	State Forces .....	6	Calhoun .....	S.C.	44.0	90.0
503	State Forces .....	2	Charlotte .....	G.&D.	8.7	80.0
504	State Forces .....	1	Columbia .....	G.&D.	9.15	98.0
505	State Forces .....	2	Columbia .....	S.C.	11.8	72.0
507	Barber-Fortin Co. ....	4	Flagler-Volusia .....	R.	10.0	52.0
515	State Forces .....	20	Jackson .....	S.C.	15.0	96.0
518	County Forces .....	29	Lafayette .....	G.&D.	15.0	0.0
519	State Forces .....	5	Manatee .....	B.M.	3.5	15.0
521	Morgan-Hill Paving Co.....	4	Nassau .....	R.	12.41	0.0
523	M. J. Cole (Co. Funds.).....	8	Okeechobee .....	B.M.	8.75	30.9
532	State Forces .....	3	Volusia .....	B.M.	18.32	98.0
534-A	J. D. Donahoo & Sons.....	24	Brevard .....	R.	2.65	23.0
534-B	Noll & Noll .....	24	Brevard .....	R.	11.81	28.0
536	County Forces .....	1	Gadsden .....	S.C.	5.5	70.0
539	County Forces .....	5	Marion .....	R.	11.3	12.0
544-A	F. S. Whitney .....	5	Pasco .....	R.	8.75	0.0
544-B	Barber-Fortin Co. ....	5	Pasco .....	R.	11.33	0.0
545	Broadbent & Groeting.....	5	Hernando .....	R.	9.51	4.0
548	State Forces .....	5	Levy .....	B.M.	20.6	98.0
553	State Forces .....	2	Marion .....	R.	9.15	7.1
554	Barber-Fortin Co. ....	4	Brevard .....	R.	5.0	56.0
560	State Forces .....	6	Calhoun .....	S.C.	20.0	56.0
562-A	Southern Surety Co.....	8	Highlands .....	G.&D.	5.37	22.0
562-B	W. P. Kennedy Const. Co.....	8	Highlands .....	S.A.	10.71	33.2
564-A	County Forces .....	5	Charlotte .....	G.&D.	10.88	0.0
564-B	Boone & Wester.....	5	Charlotte .....	G.&D.	10.31	51.0
565	State Forces .....	1	Madison .....	S.C.	15.64	10.0
570	Morgan-Hill Paving Co.....	5	Sarasota .....	S.C.	25.5	57.5
571	Hunter & Gladwell.....	1	Madison .....	S.C.	14.73	0.0
572	State Forces .....	13	Bradford .....	G.&D.	7.0	98.0
574	State Forces .....	9	Madison .....	S.C.	11.66	20.0
575	State Forces .....	3	Putnam .....	R.B.	5.46	15.0
576	S. T. Buchanan & Son.....	5	Sarasota .....	G.&D.	5.68	0.0
577	County Forces .....	19	Taylor .....	G.&D.	9.732	...
579	State Forces .....	1	Holmes .....	S.C.	8.62	26.0
584	Noll & Noll.....	24	Osceola .....	B.	2.0	60.0
586	State Forces .....	1	Jackson-Wash'ton .....	S.C.	17.37	25.0
589	County Forces .....	5	Lee .....	R.B.	8.27	0.04
597	J. Y. Wilson.....	4	Volusia .....	R.B.	16.24	.01
598-A	Walter J. Bryson.....	1	Jefferson .....	S.C.	9.45	4.0
604	C. F. Lytle.....	4	Volusia .....	R.B.	7.72	0.0
605	State Forces .....	8	Polk .....	R.S.	21.0	0.0
607	State Forces .....	13	Bradford .....	G.&D.	5.10	18.0
608	State Forces .....	4	Brevard .....	R.B.	9.29	2.0

### TOTAL MILES COMPLETED

	Brick.	S. Asp.	Bit. Mac.	Rock	Sand-C	G & D	Total
Dec. 31, 1923 .....	66.31	24.35	57.23	135.12	59.49	252.01	769.76

Note—The above tabulation shows only those projects that are actually under construction at the present time, and does not show projects that have been previously completed. However, the table, "Total miles completed," at the foot includes all projects that have been completed prior to December 31st, 1923, and the amount completed in December also. In connection with this status report it is to be noted that in the year just closed the Department built 190.98 miles of road, composed of 30.14 concrete, 1.7 brick, 4.30 sheet asphalt, 45.47 bit. mac., 39.35 sand clay, 35.11 rock base and 34.91 graded and drained. The abbreviations used are as follows:

C—Concrete. S.A.—Sheet asphalt. B.M.—Bituminous macadam. R.—Rock base. S.C.—Sand clay. G.&D.—Graded and drained.



**GREAT PROGRAM OF GOOD ROADS CONSTRUCTION SOUTH.**

(Continued from Page Three)

of steam and electric railways. In addition to the many highway bridges under way in the South the railroads are expending liberal sums for new and modern structures to care for the extensive volume of business offered. Distance is being annihilated by the modern bridge over either marshes or streams, supplanting circuitous routes, thereby reducing the time necessary to go from one county or city to another and expediting travel. A number of such structures are being financed by as many as three counties uniting in the work. They are assisted by both State and Federal aid, since the benefits to accrue are quite apparent.

That highway and bridge work is proceeding throughout the South at a record breaking pace is indicated by the publication in the construction columns of the Manufacturers Record in 1923 of 8161 road and paving notices and 2689 culvert, bridge and viaduct items. In 1922, which established a much higher record than previous years for this class of work, there were but 7539 highway notices and 2197 for bridges. In 1921 the road items numbered 4601 and bridges 1029. Totals of 3331 and 664 for road and bridge items, respectively, were recorded in 1920. Hence, it is seen that during the past four years construction of this character has been steadily increasing, and indications are that the present activity will be maintained and even increased.

Legislatures now meeting in some of the States, are expected to make available additional funds at an early date, and in view of the voting and sale of bond issues during the early winter months an appreciable number of contracts will be placed before spring opens.

The outstanding features of the work now under way are the comprehensive programs for development of adequate road systems to serve towns, cities, counties and states in the fullest possible measure, and to connect with roads forming a part of the systems in adjoining States, thereby initially providing, at minimum cost, main highway arteries and permitting the less important connecting links to be built as they are needed in the future.

Reports from the highway departments of the various Southern States in this issue, clearly indicate the tremendous program underway and in sight. They outline also the recent noteworthy accomplishments in the fulfillment of the South's highway program.—Manufacturers Record.

**POLK COUNTY GROWTH AND DEVELOPMENT IS ROMANCE OF HIGHWAY CONSTRUCTION.**

(Continued from Page Nineteen)

the base. Coarse sand and fine Florida limestone for use in the filler was readily available.

The new roads were laid on a clay base about seven inches thick. The surface was composed of a two-inch asphalt sheeting. The roads are marvelously smooth and since they were laid with proper care as to drainage are expected to last indefinitely. Since the roads were constructed the repair bills have related only to some of the clay shoulders of the nine-foot roads and, in a few rare instances, to lack of proper drainage in construction.

In the larger towns of Polk County the motorist

sees a few brick pavements. The remainder of the city streets, as well as all the county roads, are now of asphalt. And those who pass from the brick roads of neighboring counties, fine though they are in many instances, beam with pleasure at the ease encountered in travelling along Polk County's fine new roads.

The new highways have put the county in the forefront of the fruit and vegetable producing districts of the South. Thousands of acres of new orchards and vegetable gardens as well as general agricultural lands have been opened to production and the marketing of the county's products has not only been rendered more expeditious but has been greatly reduced in cost. The people of Polk County are now numbered among the most enthusiastic advocates of good roads in the country.—Better Roads and Tractor.

**GLADES COUNTY TO VOTE ON \$275,000 ROAD BONDS.**

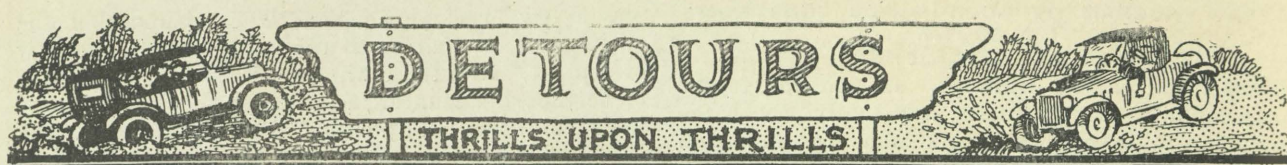
Moore Haven, Fla.—An election has been ordered for the first week in March by the Glades County commissioners on a bond issue of \$275,000 for road construction. The plan is to complete a highway across the county connecting with the Palm Beach Highway on one side and the Highlands County Highway on the other. The road will be forty miles long, of which twenty-one miles are to be built, the remainder having recently been completed. Its construction will consist of pebble on a shell foundation. It is also planned to build another road from Palm-dale to the Kissimmee river.—Manufacturers Record.

The State of Minnesota for the safety of the driving public is painting a line down the center of every mile of the 416 miles of pavement in the State.

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### "A DOGGONE GOOD STORY"

Scene—A street in California, (no, not Alberta) asphalted and signed "No Parking." Enter a little woolly dog, carrying the fag end of the hambone of a beef. He was bent on burying the bone, and scratched the asphalt here—scratched the asphalt there—with no avail, the dirt refused to fly. From street to street he went, carrying the bone, trying to bury it without success—until suddenly he was seen to pick up the bone, and with a glance at the sign overhead, beat it like a streak up the road.

A resident was curious enough to go over to the sign which had caused the dog to bolt, and read "Six miles to dirt road." Who says road signs are no good when even a dog can read 'em?—American Motorist.

The husband, who had a great habit of teasing his wife, was out driving with her, when they met a farmer driving a span of mules. Just as they were about to pass the farmer's rig the mules turned their heads toward the auto and brayed vociferously.

Turning to his wife, the husband remarked: "Relatives of yours, I suppose?"

"Yes," said his wife, sweetly, "by marriage."—Chevrolet Review.

Here's to the memory of Adam Ring.

Of road hogs Adam was the king.

Until one day he met a truck—

Now Adam lies beneath the muck.

Sunshine Magazine.

Here's to the memory of Walter Hupp.

He tried to put storm curtains up

As he stood out in the pouring rain—

Now he's in an asylum for the insane.

—P. H. A. in Florida Times-Union.

Probably the outstanding concrete paving project of the year in the Southeast was the Jacksonville-Lake City Highway, a 43-mile stretch, which was opened to traffic in June. It ranks among the longest continuous pieces of concrete highway in the country.

With the concrete road from Pensacola to the Gulf of Mexico, it forms a typical example of Florida's recent progress in highway construction; and the two are forerunners of the highways which will soon link all the important places in Florida to make them easily accessible to motor vehicles.—Manufacturers' Record.

In the clean up on advertising signs on the State highways the State of Washington has torn down 5,000 signs from 1,100 miles of highway. The State Highway Department reports that the State system is now practically free from advertising signs.

### Located

"Look here," exclaimed the stranger, as he stumbled into his twentieth puddle, "I thought you said you knew where all the bad places were on this road."

"Well," replied the native, who had volunteered to guide him through the dark, "we're finding them, ain't we?"—Literary Digest.

### The Quick and the Dead

A clergyman, while instructing a Sunday school class, asked the children the meaning of "the quick and the dead." This seemed to puzzle them somewhat, but suddenly one small boy piped out, "Please, sir, the man as gets out of the way of the motor car is quick, and 'im as doesn't is dead."

### Gates Ajar

"Is this the speedometer?" she asked, as she tapped on the glass which covered that instrument.

"Yes, dear," I replied in a sweet, gentle voice.

"Don't they call this the dashlight?" she queried, fingering the little nickel-plated illuminator.

"Yes, honey." My words floated out softly as before.

"And this is the cutout?" she inquired.

"Yes, toodles," as I took my foot off the accelerator. Not more than 200 feet away our course was blocked by a fast moving freight train.

"But what on earth is this funny looking pedal?" she said in a curious tone, as she gave the accelerator a vigorous push with her dainty foot.

"This, sweetheart, is Heaven," I said in a soft, celestial voice, as I picked up a golden harp and flew away.—Yale Record.

### MOTORISTS' EPITAPHS

No lights at all

Had Oswald Sharp;

He's gone to play

A golden harp.

An epitaph

To Squire Scott;

The highway turned,

His car did not.

Lies slumbering here

Alphonso Churl;

He had his arm

Around a girl.

At fifty miles

Drove Ollie Pidd.

He thought he wouldn't,

But skid he did.

At ninety miles

Drove Edward Shawn;

The auto stopped,

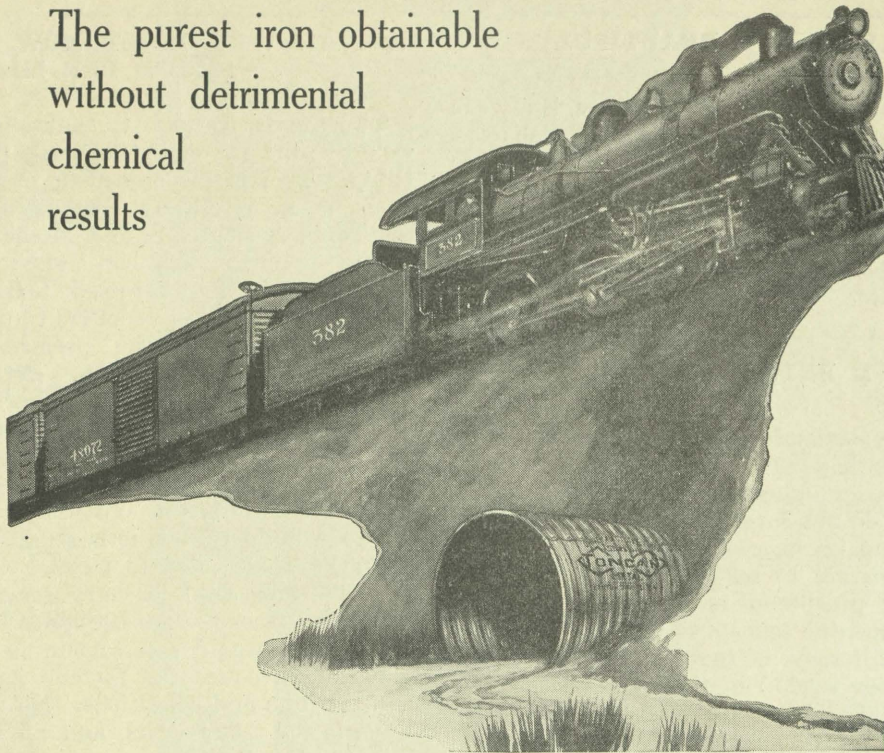
But Ed. kept on.

—Miami Motorist.





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**HISTORICAL AND BEAUTIFUL**

The road shown on the first, or title page, is a scene on the St. Augustine road, just east of Tallahassee. This road was the old stage road between Tallahassee and St. Augustine in Territorial days. It is in excellent condition and is still a main thoroughfare out of the Capital City to the east. It is conceded to be one of the most beautiful roads from a scenic standpoint in all Florida.

**MAKING LIFE BETTER WORTH LIVING**

There is a very intimate connection between good roads everywhere and education. Indeed, there is hardly a subject, an industry, a plan, and activity into which roads do not enter somewhere. But rural education is bound up in good roads. Where roads are good, children get to school. Where roads are good, farmers are prosperous and children have time to go to school, and the schools to which they go are good schools. Illiteracy is found where roads are poor. Not all poor roads run through illiterate sections, of course, but all illiterate sections of the nation are supplied only with poor roads. Where the roads are good, the schools do not close to harvest crops.—Exchange.

Loose automobile nuts are most dangerous when one of them is driving.—Levang's Weekly.

**APPIAN WAY BUILT NOW WOULD COST  
\$250,000 PER MILE**

Two hundred and fifty thousand dollars per mile would be the cost of the famous Appian Way if built today. This is the statement of Prof. W. G. Emmons, of the Highway Engineering Department of the Texas Agricultural and Mechanical College. He says:

"Sometimes the harassed taxpayer when faced with the immediate possibility of paving assessments, inquires regarding the permanent highways of which he has read so much. Perhaps, too, if he is a student of history, he may remark with feeling that the Appian Way built by the Romans has lasted for some 2,000-odd years and that the pavements of other ancient peoples are still in existence. These old pavements certainly are in existence, to the credit of the old road builders, but it is true also that they have never been subjected to modern traffic. Also they were built of solid masonry sometimes several feet thick, and recent rough estimates have developed the fact that it would cost something like \$250,000 per mile to reproduce the famous Appian Way under present costs and conditions. No wonder these highways lasted 2,000 years, and no wonder we do not imitate them."

"The convenience and comfort of a good road," says the Elmore Eye, Michigan, newspaper, "is a magnet that draws trade and business and that spreads prosperity into surrounding territory."

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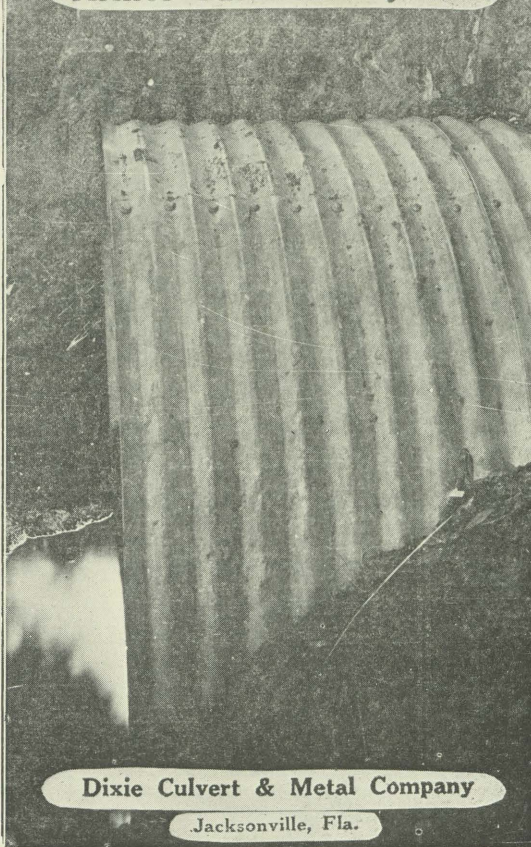
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of 60-inch ARMCO 52  
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cleaning out a few inches  
of sand



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